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ABSTRACT

This overview of the International Environmental Education Programme (IEEP) begins with an introduction which outlines IEEP objectives and goes on to provide, in section 2, a working definition of environmental education (EE). This is followed by three reports, on the Belgrade Workshop on Environmental Education, regional conferences, and the Intergovernmental Conference on Environmental Education (ICEE) respectively. The first report includes "The Belgrade Charter--A Global Framework for Environmental Education," which focuses on the environmental situation, environmental action goals, EE goals, EE objectives, and guiding principles of EE programs. It also describes workshops proceedings, and gives a list of working papers discussed at the conference. The ICEE report includes discussions of major environmental problems in contemporary society, the general conference report (addressing such issues as environmental problems and the role of education, current EE efforts, national level strategies, EE programs and curricula, instructional materials, personnel training), and the declaration adopted by conference delegates. Provided in appendices are descriptions of the United Nations Environment Programme, the International Environmental Education Network, and Unesco's Man and the Biosphere Programme; the main working document for the ICEE; and a statement by the International Union for Conservation of Nature and Natural Resources (presented at the ICEE conference) which focuses on its role in environmental education. (BC)

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Table of Contents

- I. Introduction 3
- II. A Working Definition of Environmental Education 5
- III. The Belgrade Workshop on Environmental Education (October 1975) 6
 - A. *The Belgrade Charter - A Global Framework for Environmental Education* 6
 - 1. Environmental Situation 6
 - 2. Environmental Goal 7
 - 3. Environmental Education Goal 7
 - 4. Environmental Education Objectives 7
 - 5. Audiences 8
 - 6. Guiding Principles of Environmental Education Programmes 8
 - B. *The Belgrade Workshop Proceedings* 8
 - C. *Working Papers Discussed at the Belgrade Workshop* 8
- IV. Regional Meetings or International Environmental Education 9
 - A. *The European Regional Meeting on Environmental Education (Helsinki, January 1977)* 10
 - 1. Proceedings 10
 - 2. Recommendations and Strategies for Action 11
 - B. *The North American Sub-Regional Seminar on Environmental Education (St. Louis, Missouri, October 1976)* 11
- V. The Intergovernmental Conference on Environmental Education (Tbilisi, Georgia, U.S.S.R., October 1977) 13
 - A. *Broad Lines of the Agenda of the Tbilisi Conference* 13
 - 1. Major Environmental Problems in Contemporary Society 14
 - 2. The Role of Education in Facing the Challenges of Environmental Problems 14
 - 3. Current Efforts at the National and International Levels for the Development of Environmental Education 14
 - 4. Strategies for the Development of Environmental Education at the National Level 15
 - 5. Regional and International Co-operation for the Development of Environmental Education 15
 - B. *General Report* 15
 - 1. Environmental Problems and the Role of Education 15
 - 2. Current Efforts 16
 - 3. Strategies at the National Level 16
 - 4. Regional and International Co-operation for the Development of Environmental Education 19
 - 5. Roles, Objectives and Characteristics of Environmental Education 21
 - 6. By Way of Conclusion 23
 - C. *The Tbilisi Declaration* 23
 - D. *Canadian Delegation to Tbilisi Conference* 24
 - E. *Main Working Document for the Tbilisi Conference* 24

Appendix I
United Nations Environment Programme
(UNEP) 25

1. Introduction 25
2. UNEP Governing Council 25
3. The Environment Co-ordinating Board 25
4. Principles of Action and the Programmatic Process 25
5. Education and Training - Essential Elements in the United Nations Environment Programme 26
6. Environmental Education as a Supporting Measure in UNEP 27
7. Environmental Training as a Supporting Measure in UNEP 27

Appendix II
The International Environmental Education
Network 28

Appendix III
Unesco's Man and the Biosphere
Programme 29

1. A New Approach 29
2. The Beginnings 29
3. The Way MAB Works 29

Appendix IV
Statement by the International Union for
Conservation of Nature and Natural Resources
(IUCN) at the Tbilisi Conference 30

1. Introduction 30
2. Education and the Challenge of Environmental Problems 30
3. The IUCN Role in Environmental Education 31

Appendix V
Acronyms 32

Appendix VI
Main Working Document for Tbilisi
Intergovernmental Conference on Environmental
Education 33

- A. Chapter I: Major Environmental Problems in Contemporary Society 33
- B. Chapter II: The Role of Education in Facing the Challenges of Environmental Problems 38

Appendix VII
Suggestions for Further Reading 43

- A. Unesco Documents Relating to the Meetings and Colloquia Mentioned 43
- B. Other Unesco Publications 44
- C. Publications of Other Organizations Relating to Environmental Education 44

Unesco and Environmental Education

I. Introduction

Development and its impact on the environment – environmental problems and the quality of human life – have become a major preoccupation of governments and peoples throughout the world.

In 1972 this global concern led to the United Nations Conference on the Human Environment, which was held in Stockholm. Here, participants stressed the role of education, of both the public and the specialist, in the solution and prevention of the world's environmental problems. Recommendation 96 particularly called on "the organization of the UN system, especially Unesco. . . to take the necessary steps to establish an international programme in environmental education, interdisciplinary in approach, in-school and out-of-school, encompassing all levels of education and directed towards the general public. After UNEP (United Nations Environment Programme) was established, environmental education and training became one of its principal supporting measures.

In response to the Stockholm Recommendation, Unesco and UNEP jointly launched the current International Programme for Environmental Education, which commenced in January 1975. As a culmination of the initial three-year phase of that programme, the first Inter-governmental Conference on Environmental Education took place in Tbilisi, U.S.S.R., from 14 to 26 October 1977.

This issue in our *Occasional Papers* series is devoted to an overview of the International Environmental Education Programme, from the holding of the International Environmental Education Workshop held in Belgrade in October 1975 to the Tbilisi Conference. It starts with the Belgrade Charter, which established principles and a global framework for environmental education. It ends with a report on the Tbilisi Conference, from which the main recommendations will form the basis for Unesco and UNEP to propose a follow-up programme in environmental education.

The objectives of the International Environmental Education Programme from 1975-1978 are to:

- promote the exchange of ideas, information and experiences relating to environmental education among the nations and regions of the world;
- promote the development and coordination of research activities leading to a better comprehension of the objectives, content, and methods of environmental education;
- promote the development and evaluation of new materials, curricula, instructional materials and programmes in the field of environmental education;
- promote the training and retraining of key personnel for the development of environmental education, such as teachers, planners, researchers and educational administrators;
- provide technical assistance to Member States for the development of environmental education programmes.

The activities of the International Programme for Environmental Education fall within these principal areas:

- research, experimentation and development of innovations in the field of environmental education, primarily through a world-wide programme of pilot projects;
- the gathering, organization and dissemination of information concerning environmental education, principally through a global network system of information about individuals and institutions in the field of environmental education and the publication of an international newsletter;
- promotion of the discussion and elaboration of policies and strategies for the development of environmental education at all levels - local, national, regional and global.

Central to the International Environmental Education Programme and its last-mentioned area of activity has been the series of meetings, begun at Belgrade, continued through regional seminars in Bogotá, Brazzaville, Kuwait, Bangkok and Helsinki, and climaxing in Tbilisi. Space does not allow us to go into great detail on all the activities and meetings held within the framework of the International Environmental Education Programme, and suggestions for further reading are to be found in Appendix VII. We refer in particular to the 5 working and background papers prepared by the Secretariats of Unesco and UNEP for the Tbilisi Conference.

The Canadian Commission for Unesco was involved in preparations for the North American Sub-Regional Seminar on Environmental Education held in St. Louis, Missouri, in October 1976, and seven Canadians (see item on North American Sub-Regional Seminar) sat on the Seminar Advisory Committee.

Further, in collaboration with the Council of Ministers of Education, Canada, and with the Department of External Affairs, the Canadian Commission for Unesco was responsible for holding an *ad hoc* consultative meeting in September 1977, the main conclusions of which served as the basis of the briefing document prepared for the Canadian delegation to the Intergovernmental Conference on Environmental Education (Tbilisi, October 1977). Some points of "perspective paper" prepared by the Canadian participants in the St. Louis meeting were also included in the brief.

We acknowledge the extensive use in this *Occasional Paper* of excerpts from *Connect*, the Unesco/UNEP Environmental Education newsletter, and suggest that those interested in reading in greater detail about the International Environmental Education Programme consult the Appendix VII.

Further information may also be obtained by writing to the undersigned:

J. Tim Douglas
Programme Officer
Canadian Commission for Unesco

II. A Working Definition of Environmental Education

Readers may be interested in the following "working definition" used in 1975 by the Unesco secretariat for the purposes of a survey of environmental education activities in Member States:

"Environmental education is first of all, a form of education. For purposes of this questionnaire, education is used in the broad sense to mean *any deliberate attempt to help someone learn something in some setting*. Among other things this implies that:

- education embraces all types and levels of 'formal' education (in school), as well as all forms of 'non-formal' education (i.e., deliberate attempts to promote any kind of learning in the home, on-the-job, through clubs, etc.);
- education covers all deliberate efforts to promote learning, regardless of the nature of the things to be learned - concepts, principles, skills, attitudes, facts, etc., therefore, as used in this questionnaire education includes the various activities which focus on helping students achieve particular types of learning objectives;
- education clearly encompasses all deliberate efforts to promote learning, regardless of the particular characteristics of the learners - their age, number, ability, motivation, prior achievement, etc.

The term environment is also used in this questionnaire in the broad sense, to include *everything which surrounds and/or touches an individual*, including:

- the natural and the 'man-made' environment, as well as the 'socio-cultural' environment (human groups and their interactions, institutions, laws, policies, etc.);
- the interaction of humans with the environment which can be comprehended in part through the learning of related concepts, principles, facts, etc. The environment is an area about which individuals can form values and attitudes. They can influence this interaction if, in addition to knowledge and attitudes, they acquire relevant skills.

In the light of the broad uses of the terms 'environment', it is clear that environmental education is not and cannot be one thing; it has an *immense number of legitimate forms*, depending on such things as: (a) the age and prior education of the learners; (b) the particular objectives to be achieved (e.g., broad understanding required of any citizen versus specialized skills for an engineer); (c) the overall educational situations (e.g., the organization of the curriculum and the school or media system); (d) the general socio-economic-cultural conditions, etc.

Consequently, environmental education is any deliberate attempt to help individuals (whoever they may be) learn something (whatever may be the objectives - concepts, skills, attitudes, facts, etc.) in some setting (in school or out-of-school) about the environment (broadly conceived), the dynamics of man's reciprocal interaction with it (individually and collectively), and the need for and ways of affecting this interaction process."

III. The Belgrade Workshop on Environmental Education

An historic moment produced an historic document. Adopted unanimously at the close of the 10-day International Environmental Education Workshop at Belgrade, 13-22 October 1975, subject to the evolution of inevitable change and improvement, the Belgrade Charter has laid down the principles and established the guidelines for the world-wide environmental education.

A. The Belgrade Charter - A Global Framework for Environmental Education

1. *Environmental Situation*

Our generation has witnessed unprecedented economic growth and technological progress which, while bringing benefits to many people, have also caused severe social and environmental consequences. Inequality between the poor and the rich among nations and within nations is growing and there is evidence of increasing deterioration of the physical environment in some forms on a world-wide scale. This condition, although primarily caused by a relatively small number of nations, affects all of humanity.

The recent United Nations Declaration for a New International Economic Order calls for a

new concept of development - one which takes into account the satisfaction of the needs and wants of every citizen of the earth, of the pluralism of societies and of the balance and harmony between humanity and the environment. What is being called for is the eradication of the basic causes of poverty, hunger, illiteracy, pollution, exploitation and domination. The previous pattern of dealing with these crucial problems on a fragmentary basis is no longer workable.

It is absolutely vital that the world's citizens insist upon measures that will support the kind of economic growth which will not have harmful repercussions on people; that will not in any way diminish their environment and their living conditions. It is necessary to find ways to ensure that no nation should grow or develop at the expense of another nation and that the consumption of no individual should be increased at the expense of other individuals. The resources of the world should be developed in ways which will benefit all of humanity and provide the potential for raising the quality of life for everyone.

We need nothing short of a new global ethic - an ethic which espouses attitudes and behaviour for individuals and societies which are consonant with humanity's place within the biosphere; which recognizes and sensitively responds to the complex and ever-changing relationships between humanity and nature and between people. Significant changes must occur in all of the world's nations to assure the kind of rational development which will be guided by this new global ideal - changes which will be directed towards an equitable distribution of the world's resources and more fairly satisfy the needs of all peoples. This new kind of development will also require the maximum reduction in harmful effects on the environment, the utilization of waste materials for productive purposes, and the design of technologies which will enable such objectives to be achieved. Above all, it will demand the assurance of perpetual peace through coexistence and co-operation among nations with different social systems. Substantial resources for reallocation to meet human needs can be gained through restricting military budgets and reducing competition in the manufacture of arms. Disarmament should be the ultimate goal.

These new approaches to the development and improvement of the environment call for a re-ordering of national and regional priorities. Those policies aimed at maximizing economic output without regard to its consequences on society and on the resources available for improving the quality of life must be questioned. Before this changing of priorities can be achieved, millions of individuals will themselves need to ad-

just their own priorities and assume a personal and individualized global ethic – and reflect in all of their behaviour a commitment to the improvement of the quality of the environment and of life for the world's people.

The reform of educational processes and systems is central to the building of this new development ethic and world economic order. Governments and policy-makers can order changes, and new development approaches can begin to improve the world's condition – but all of these are no more than short-term solutions, unless the youth of the world receives a new kind of education. This will require new and productive relationships between students and teachers, between schools and communities, and between the education system and society at large.

Recommendation 96 of the Stockholm Conference on the Human Environment called for the development of environmental education as one of the most critical elements of an all-out attack on the world's environmental crisis. This new environmental education must be broad based and strongly related to the basic principles outlined in the United Nations Declaration on the New International Economic Order.

It is within this context that the foundations must be laid for a world-wide environmental education programme that will make it possible to develop new knowledge and skills, values and attitudes, in a drive towards a better quality of environment and, indeed, towards a higher quality of life for present and future generations living within that environment.

2. *Environmental Goal*

The goal of environmental action is to improve all ecological relationships, including the relationship of humanity with nature and people with each other.

There are, thus, two preliminary objectives:

- a. For each nation, according to its culture, to clarify for itself the meaning of such basic concepts as "quality of life" and "human happiness" in the context of the total environment, with an extension of the clarification and appreciation to other cultures, beyond one's own national boundaries.
- b. To identify which actions will ensure the preservation and improvement of humanity's potentials and develop social and individual well-being in harmony with the biophysical and man-made environment.

3. *Environmental Education Goal*

The goal of environmental education is to develop a population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

4. *Environmental Education Objectives*

The objectives of environmental education are:

- a. Awareness: to help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems.
- b. Knowledge: to help individuals and social groups acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it.
- c. Attitude: to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement.
- d. Skills: to help individuals and social groups acquire the skills for solving environmental problems.
- e. Evaluation ability: to help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, esthetic and educational factors.
- f. Participation: to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve those problems.

5. Audiences

The principal audience of environmental education is the general public. Within this global frame, the major categories are:

- a. The formal education sector: including pre-school, primary, secondary and higher education students as well as teachers and environmental professionals in training and retraining.
- b. The non-formal education sector: including youth and adults, individually or collectively, from all segments of the population, such as the family, workers, managers and decision-makers, in environmental as well as non-environmental fields.

6. Guiding Principles of Environmental Education Programmes

The guiding principles of environmental education are:

- a. Environmental education should consider the environment in its totality – natural and man-made, ecological, political, economic, technological, social, legislative, cultural and esthetic.
- b. Environmental education should be a continuous life-long process, both in-school and out-of-school.
- c. Environmental education should be interdisciplinary in its approach.
- d. Environmental education should emphasize active participation in preventing and solving environmental problems.
- e. Environmental education should examine major environmental issues from a world point of view, while paying due regard to regional differences.
- f. Environmental education should focus on current and future environmental situations.
- g. Environmental education should examine all development and growth from an environmental perspective.
- h. Environmental education should promote the value and necessity of local, national and international co-operation in the solution of environmental problems.

B. The Belgrade Workshop Proceedings

Most striking was the sense of unanimity cutting across national and cultural frontiers among the 96 participants and observers from some 60 countries, East and West, North and South, at the Belgrade Workshop. They were facing together the common problem of the environment of their common – one and only – earth. Their common goal was to frame the global pattern of environmental education for all ages, in and out of school.

The participants themselves were equally distributed among the five Unesco regions – Africa, Arab States, Asia, Europe-North America and Latin America. They represented all levels of formal and non-formal education – primary, secondary and tertiary, youth and adult – as well as major international organizations concerned with environmental education – both government and non-government.

The principal aims of the Belgrade Workshop were (1) to review and discuss the trends and emerging issues in environmental education; and (2) to formulate on this basis, guidelines and recommendations for furthering environmental education internationally. Activities of this ten-day working conference revolved around its working groups, in which all participants were involved on a cross-cultural, multi-national basis. A set of 15 trend papers offered a starting point for the discussions. In addition, there were meetings of regional groups to help prepare for regional seminars, projects and programme actions following the Belgrade workshop.

Besides the 15 trend papers – inputs for the Belgrade Workshop – there were Unesco/UNEP consultants' missions and reports and a preliminary, but elaborate, world survey of environmental education needs and priorities in preparation for the Belgrade workshop.

N.B. The Recommendations of the Belgrade Workshop on Environmental Education (Document ED/5/WS. 15) are available in English and French on request from the Canadian Commission for Unesco.

C. Working Papers Discussed at the Belgrade Workshop

Janapala Allex (Sri Lanka) and A. Chiba (Japan), *Environmental Education at the Pre-School and Primary Level*, Unesco/Unicef Unit, Department of Education Planning and Financing, Unesco, 7 place de Fontenoy, 75700 Paris, France.

Dean Bennett, *The Evaluation of Environmental Education Material and Learning*, Main Environmental Education Project, Intermediate School District, Yarmouth ME 04096, U.S.A.

- Adriana Buzzatti Traverso (Italy), *Some Thoughts on the Philosophy of Environmental Education*, Senior Scientific Adviser, UNEP, P.O. Box 30552, Nairobi, Kenya.
- Jan Cerovsky, *Instructional Resources for Environmental Education*, Statní Ústav Památkové Péče, A Ochrany Přírody, 118 01 Praha 1, Mala Strana, Valdštejnské, Nam C.1., Czechoslovakia.
- Hubert Dyasi, *International and Regional Co-Operation*, Science Education Programme for Africa, P.O. Box 9169 Airport, Accra, Ghana.
- Arturo Eichler, *Environmental Education at the Secondary School Level*, Apartado 256, Merida, Venezuela.
- Lars Emmelin, *Environmental Education Programmes for Adults*, Environmental Studies Programme, Helgonavägen 5, 223 62 Lund, Sweden.
- Johannes Goudswaard, The Netherlands State Committee on Environmental Education, Jan van Loonslaan 20a, Rotterdam-3001 (Netherlands), and Mirta de Teitelbaum (Argentina), Consultant, *Learning Environments for Environmental Education*, Environmental Education Section, Unesco, Paris (France).
- Michel Maldague, *Environmental Studies for Specialists in Non-Environmental Fields*, Université Laval, Programme Interdisciplinaire en Aménagement du Territoire et Développement Régional, Cité Universitaire, Québec, Canada.
- Allen A. Schmieder, *The Nature and Philosophy of Environmental Education: Goals and Objectives*, United States Office of Education, Division of Educational Systems Development, 7th and D Streets S.W., Room 3052, Washington DC 20202, U.S.A.
- Saber Selim, *Environmental Education at the Tertiary Level*, Director, Science Department, ALECSO, Dokki Square, 109 Tahir Street, Cairo, Egypt.
- Edward W. Weidner, *Environmental Education at the Tertiary Level for General Students*, Chancellor, The University of Wisconsin at Green Bay, and Robert Cook, Associate Professor of Environmental Control, The University of Wisconsin at Green Bay, Green Bay, WI 54302, U.S.A.
- Keith Wheeler, *National Procedures for Implementing Environmental Education: A Comparative Study*, City of Leicester College of Education, Scroftoft, Leicester, LE7 9SU, England.
- David Withrington, *Environment Education Programmes for Out-of-School Youth*, 6 Sutton Court Mansions, Grove Park Terrace, London, W. 4, England.
- David Wolsk, *Methodologies of Environmental Education*, Faculty of Education, University of Victoria, Victoria, British Columbia, Canada.

IV. Regional Meetings on International Environmental Education

As of the end of January 1977, a meeting of experts devoted exclusively to environmental education has been held in every Unesco region of the world - Africa, the Arab States, Asia, Europe-North America and Latin America. The regional meetings have followed the Belgrade Workshop, which was conceived and organized as the springboard for the International Environmental Education Programme, launched jointly by Unesco and UNEP (United Nations Environment Programme).

All the meetings are best appreciated in the context of the overall objectives and activities of the new International Environmental Education Programme, whose first, three-year phase was initiated in January 1975 and whose culminating activity was the ministerial-level Intergovernmental Conference held in Tbilisi, U.S.S.R., October 1977.

The general purpose of the regional meetings was to bring together environmental education experts, in their personal capacity, to: (1) identify and discuss environmental education in their particular region; (2) review the guidelines and recommendations of the Belgrade Workshop in the light of their region's environmental education needs; (3) discuss ways to develop the exchange of ideas and information so as to establish

lish or strengthen a regional network system and co-operation in environmental education; and (4) formulate regional strategies for future action.

Conclusions varied from region to region, because of the varying environmental situation and state of development. A consensus emerged, however, as to the concept of environmental education as multidisciplinary and problem-solving in its approach, life-long in its conduct both inside and outside the formal school system, and encompassing in its view of the environment as a totality – natural and man-made, ecological, economic, social and cultural.

Similarly, the goal of environmental education was generally agreed upon as aiming at the improvement of all environmental relationships, including the relationship of humanity with nature and people with each other. The modalities alone differed according to the situation, needs and priorities of each region, as they were identified and discussed at each regional meeting.

A principal constraint, often pointed out by participants, was the rigidity of formal, traditional education which tended towards single-discipline instruction, in contrast and opposition to the inter- and multi-disciplinary approach of environmental education. A principal need, it was also affirmed, was co-ordination and co-operation at the regional and global level to achieve both environmental and environmental education goals.

A. The European Regional Meeting on Environmental Education

Thirty experts from 29 countries, including the United States and Canada, assembled for the European Regional Meeting on Environmental Education, held in Helsinki, Finland, 27–31 January 1977. The 30 participants were joined by 53 observers from UN and other organizations as well as from a number of European regional countries.

1. Proceedings

Following presentations on the state of the environment and the situation of environmental education in Europe, the meeting was organized into three working groups which dealt with: (1) pre-school, primary and secondary levels of environmental education; (2) EE at the tertiary or university and post-university level; and (3) EE in the nonformal sector. Following two days' discussion of these themes, participants and observers formed two working groups to consider the remaining agenda items: (1) EE at national and local levels, and (2) regional cooperation.

Goals, objectives and guiding principles of environmental education as described in the Belgrade Charter were adopted as a general framework for discussions by all working groups. The broad, overall conclusion of the regional meeting is best cited in its entirety:

"Environmental education should be centred on specific problems, be interdisciplinary in nature, aim to strengthen the sense of values, contribute to collective well-being, concern itself with the survival of humanity, draw its strength essentially from the initiative of pupils and from their commitment to action, and take account of present and future pre-occupations. EE is essentially multidisciplinary and interprofessional. It is linked with all environmental occupations, disciplines and problems and implies the statement and teaching of the philosophy and concepts of the environment at all stages of the educational process."

Emphasis was laid on the problem-solving or "learning by doing" approach, based on a diversity of experiences and direct contact with local environments. The special problem of environmental education in urban settings was considered with the suggestion that special centres be created in cities for urban EE studies.

Inter- and multidisciplinary were stressed with special difficulties noted between the natural and the social sciences, particularly a lack of co-ordination and co-operation. At the university level, it was felt, this lack could more readily be overcome and interdisciplinary environmental education made a reality instead of simply a matter of form. Curricula themselves could be classified in two categories: (1) training of environmental generalists in an overall comprehensive understanding of environmental problems; and (2) training of environmental specialists in such sectors as urban and regional planning, pollution control and nature conservation, with specialized courses in such disciplines as biology, chemistry, geography, agronomy, medicine, sociology, and the like. The latter, participants agreed, lent itself to the most practicable solution for the problem of training and retraining environmental specialists, a method currently – and successfully – employed in all countries of Europe.

"Learning by doing" was also recommended for nonformal, youth and adult environmental education, that is, active participation of all concerned in the identification and solution of environmental problems. This, in turn, it was pointed out, meant incorporation of EE considerations in rural and urban environmental planning and development. The lack of co-ordination, co-operation and mutual information among different organisations, groups and agencies involved in environmental concerns was

mentioned as a common obstacle to general public EE. Another problem discussed was the predominance of research efforts in formal environmental education resulting in a neglect of the nonformal sector, where the need for experimental, research projects is strongly felt.

At the national and local levels, participants observed, there was a marked need to reinforce educational and community support for both formal and nonformal EE programmes; further, that national governments developing EE programmes should 'take particular care to bridge the frequent communication gap among various EE specialists, notably curriculum development experts, teachers and teacher trainers. At the global level, participants envisaged Unesco's primary role as: (1) dissemination of information and stimulation of contacts and co-operation among Member States and appropriate international organizations; and (2) aiding in the organization and funding of regional meetings, workshops, courses and pilot projects.

2. *Recommendations and Strategies for Action*

A total of approximately eighty recommendations of the European Regional Meeting on Environmental Education dealt with the themes covered by the various groups. Among them were those of a general nature as well, spanning the broad area of environmental education:

- environmental education should form an integral part of school and post-school curricula and should be provided for in legislation governing education systems of Member States;
- governments of Member States should further the establishment of institutions for the training of EE teachers, specialists and community leaders according to the needs and capacities of their respective countries;
- of prime importance is the formation of sufficient environmental specialists to cope with the environmental problems faced by humanity, and the provision of adequate training for all those concerned directly or indirectly with the management and improvement of the environment;
- the basic training of such specialists should include the study of vital environmental, ecological and sociological principles so as to permit their foreseeing the implications of their work vis-à-vis the environment;
- regional or sub-regional institutes, according to geographical and cultural groupings, should be established to train EE personnel;
- environmental education programmes should be rooted in four basic elements: fundamental disciplines, integrated, interdisciplinary studies, major environmental problems and practical projects involving real situations at local levels.

Recommendations regarding implementation of environmental education at the national level included the following:

- governments of Member States should reinforce existing mechanisms, or where necessary set up new mechanisms, for co-ordinating the work of all the agencies and ministries concerned with environmental education in their countries, and ensure continuity of representation at international meetings;
- national bodies or committees should be formed to deal with all aspects of environmental education and be linked to public and private agencies and news groups involved in the educational process, so as to establish interinstitutional and intersectorial co-ordination (government environmental protection agencies, mass media representatives, environmental youth movements and practising teachers are in particular need of such co-ordination);
- existing EE legislation should be implemented, or where necessary new legislation passed, to get EE programmes underway at national and local levels; where legislation is not the basis for curriculum change, full use should be made of advisory or other educational services to achieve the same effect.

Recommendations regarding co-operative EE activities at the subregional level among Member States of the European region dealt primarily with: the exchange and dissemination of information on programme planning, development of instructional materials and the training of teachers. With regard to the forthcoming Intergovernmental Conference, it was recommended that national preparations take place in broadly based national committees, which should be appointed as soon as possible by competent governmental authorities.

B. *The North American Sub-Regional Seminar on Environmental Education*

With the financial assistance of Unesco and the co-operation of the Canadian and U.S. Commissions for Unesco, the North American seminar on Environmental Education was convened in St. Louis, Missouri, U.S.A., 5-8 October 1976. Its organization was entrusted to the Alliance for Environmental Education, a coalition of 29 U.S. national and local EE bodies with a total membership of over 15 million. There were 303 participants at the North American Seminar.

Five central themes ran throughout the meeting: non-institutional environmental education (in the community, business, industry and government); environmental education through the media; environmental education in colleges, universities and adult education; environmental

education in grades K-12 (primary and secondary school); and action strategies to improve environmental education.

The seminar had several primary objectives: (1) to bring together concerned professionals from Canada and the United States to consider current issues and problems in environmental education; (2) to provide the means for reviewing, evaluating and developing implementation plans for relevant recommendations of the Belgrade Workshop; and (3) to identify and plan towards pilot projects and action programmes aimed at solving those environmental education problems deemed most critical by the participants.

In preparation for the North American Seminar a questionnaire was sent to about 23,000 individuals and groups in Canada and the U.S. requesting them to identify priorities among the thirty EE problem areas identified at Belgrade. Participants at the seminar could thus begin their discussions with a fairly accurate view of their own collective sense of the priorities as well as that of those who were not able to attend.

The survey of priorities was conducted in two phases, the first of which revealed the following as of major concern: the development of EE programmes and instructional materials; the training of EE personnel; and EE research.

Nine issues with implications for environmental education were indicated in the first phase of responses. These nine issues were then linked in random order for the second phase with respondents asked to rank each on a 1-4 scale of importance. Ranked first (89.9% responded with 3 or 4) was: orderly growth - sound use of land, water and other renewable resources, i.e., sound eco-development. Ranked close second: energy (as it applied to "orderly growth"). Ranked third: environmental education as a total concept, involving both physical and human components. Ranked fourth: values (their clarification as a first step towards environmentally-sound individual and collective behaviour and action). Ranked fifth: population. Ranked sixth: world-wide conservation (of natural and other resources). Ranked seventh: local environmental concerns. Ranked eighth: studies about the future. Ranked ninth: peace studies.

The target groups for environmental education were ranked in this order: elected officials making or enforcing environmental policy; teachers and trainers of teachers; government officials in general; business leaders; public school board members and school administrators; leaders in agriculture and food processing; multinational corporation leaders; television producers; publishers of educational materials; international agencies and organizations, children in early

childhood and parents of pre-school children; people working in conservation, parks and reserves, etc.; union leaders, international banking officials, leaders in medicine and health services; workers, especially foremen.

Methodologies for the implementation or "delivery" of environmental education were also ranked by respondents to the survey for the North American Seminar. They follow in order: make better use of existing EE programmes and materials; develop integrated approaches which involve schools, mass media and community organizations; bring resource managers and teachers together so that environmental education is based on a solid foundation of resource management principles; develop programmes to maintain public awareness; make better use of other education vehicles, such as museums, zoos, etc.; carry out a massive media campaign; print and disseminate copies of rules and regulations of state departments of education which have incorporated environmental education into their curricula; require a conservation course in secondary schools; and print a directory of national-level EE programmes and staffs.

Basically the seminar was broken down into many small working groups which considered three areas of major concern, as identified by the pre-seminar surveys: identification of critical EE content issues; key target groups; and implementation strategies appropriate to the issues and target groups - all in the context of North America.

Copies of the report of the seminar can be purchased at the cost of U.S. \$2.50 from:

Dr. John F. Disinger
Associate Director
Environmental Education
ERIC/SMEAC
Ohio State University
1200 Chambers Road, 3rd floor
Columbus, Ohio 43212
U.S.A.

V. The Inter-governmental Conference on Environmental Education

The world's first Inter-governmental Conference on Environmental Education, organized by Unesco in co-operation with the United Nations Environment Programme (UNEP) was convened in Tbilisi, Georgia, U.S.S.R., from 14 to 26 October 1977.

Delegates from 66 Member States and observers from two non-Member States participated as well as representatives and observers from eight agencies and programmes of the United Nations system, three other intergovernmental organizations and 20 international non-governmental organizations. In all 265 delegates and 65 representatives and observers took part in the Tbilisi Conference.

"The purpose of the conference", letters of invitation read, "will be to formulate recommendations for action which might be undertaken at the national, regional and international levels for the promotion and development of environmental education". Accordingly, "it is expected that the conference will deal with general environmental education of the public at varying levels and in different types of formal and non-formal educational systems, as well as the education and training of particular professional groups

whose actions and decisions have a definite bearing on the environment".

A. Broad Lines of the Agenda of the Tbilisi Conference

The substantive points of the agenda for the conference at Tbilisi involved consideration of the following themes:

1. Major environmental problems in contemporary society.
2. The role of education in facing the challenges of environmental problems.
3. Current efforts at the national and international levels for the development of environmental education.
4. Strategies for the development of environmental education at the national level:
 - a. general environmental education of the public through formal and non-formal education;
 - b. environmental education (including in-service education) of particular professional groups whose actions and decisions have implications for the environment.
5. Regional and international co-operation for the development of environmental education: needs and modalities.

A working document corresponding to the five themes above was prepared for distribution to conference participants, in order to aid discussions and highlight problems concerning which participants might wish to formulate recommendations for possible actions at the national, regional and global levels.

As for the conference itself, inputs for the principal working document came from virtually all the activities - meetings, consultations, studies and reports - of the Unesco/UNEP International Programme for Environmental Education. Specifically, these might be mentioned: (1) Environmental Education Needs and Priorities: A World Survey; (2) Trends in Environmental Education; (3) reports of experts missions to 81 Member States of the developing world; (4) results of the Belgrade Workshop and of regional and sub-regional meetings on environmental education; and (5) information contained in project proposals from every region of the world. Lastly, a preliminary draft of the working document was reviewed by a group of experts from the world's regions, who met in Unesco's headquarters for the purpose of counselling the secretariats of Unesco and UNEP on its final form and content.

In addition, an annotated agenda was prepared by the secretariat of Unesco. Here it might be useful to indicate some of the broad lines tentatively sketched in both documents according to the substantive points of the agenda.

1. Major Environmental Problems in Contemporary Society

A frame of reference is provided for discussions and recommendations concerning the role of education in the perception, solution and prevention of environmental problems. The ideas presented reflect in general the concepts which emerged at the Stockholm Conference on the Human Environment (1972) and which were further developed by Unesco and UNEP in their joint and separate programme activities.

A primary concept involves consideration of the environment as a totality, as the natural and social system in which human beings and other organisms live and from which they draw sustenance. Major environmental problems, in turn, are being analyzed according to the scale of the geographical areas affected (local, national, regional or global), the kind of biophysical and social concerns which arise and the type of problems that differing patterns and rhythms of development can pose.

The significance and implications of environmental problems in the context of development receive special attention, as does the human environment in the perspective of a new international economic and social order. The solution of environmental problems, it might be suggested, lies not so much in the field of technology, though technological skills are often essential, as in coping with the social, economic and cultural factors giving rise to them. In this connection, the development of a general framework for education concerning the environment for all sectors of society, inside and outside the school system, as called for in Recommendation 96 of the Stockholm Conference, becomes of paramount importance.

2. The Role of Education in Facing the Challenges of Environmental Problems

The concept, goals, objectives, audiences and characteristics of an education concerned about the environment, both natural and man-made, are considered at this point.

Environmental education is seen as part of the entire educational process rather than as a separate subject, such as mathematics, physics or biology, simply to be added to educational curricula. A primary goal would be to open individuals to a comprehension of the complex nature of the environment, the interdependence of its biological, physical, social and cultural aspects. This in turn could motivate rational and responsible behaviour in the utilization of the earth's resources for the satisfaction of material and spiritual human needs now and in the future. Furthermore, environmental education stresses

the role and importance of the environment in economic, social and cultural development. Lastly, it leads to an understanding of the interlocking nature of the world's environments, contributing to a sense of reciprocal responsibility among nations and regions.

The achievement of such goals assumes an educational process which establishes as its objectives to develop individually and collectively environmental awareness, knowledge and skills; and socially sound values and behaviour. As for the audiences of environmental education, they are conceived as composing all members and social categories of a community at all age levels, inside and outside the formal school system.

A functional and methodological distinction may be made among three types of environmental education and training: (1) the general environmental education of the public from childhood through adulthood in both the formal and the non-formal education sectors; (2) the environmental education of specific professional and social groups whose actions have an influence on the environment (engineers, architects, urbanists, economists, workers, industrialists, etc.); and (3) the training of scientists, technologists and other professionals who deal directly with environmental problems (foresters, biologists, hydrologists, ecologists, and the like).

The characteristics of environmental education which are involved in the successful achievement of its stated goals and objectives include: a problem-solving approach; an inter- and multi-disciplinary methodology; and a community-based orientation – all in a continuous, lifelong educational process.

3. Current Efforts at the National and International Levels for the Development of Environmental Education

The main working document for the Tbilisi Conference attempts to outline major trends in current environmental education efforts, as well as the problems and constraints confronted, at the national and international levels. The principal sources were documents such as *Trends in Environmental Education* and *Environmental Education Needs and Priorities*. Space does not allow even a summary of the activities within the United Nations system, particularly of Unesco and UNEP, much less those of Member States and the growing number of governmental and non-governmental organizations concerned about education for the environment.

4. *Strategies for Developing Environmental Education at the National Level*

The participants at the conference were particularly asked to pay attention to the following:

- the need to integrate environmental education as a fundamental objective and dimension in (1) national policies and plans for the development of education for the public, appropriate social and professional groups, and specialists in environmental fields, as well as in (2) educational reform and innovation efforts;
- the possibility of establishing or reinforcing the interdisciplinary and interinstitutional grouping of educators, scientists and professionals in environmental fields thus aiding educational policy-makers to incorporate the environmental dimension in the various levels and forms of in-school and out-of-school education;
- the need to develop within each Member State an action programme with the goal of familiarizing educators, educational administrators and planners with the different aspects and problems of the environment as well as furnishing them with the training for efficiently embodying environmental education in their respective activities;
- the special effort required for the creation and utilization of appropriate environmental education materials;
- the need for immediate measures within the formal education system, pending longer-term planning, which provide for: (1) incorporating environmental education in traditional disciplines; (2) developing multidisciplinary educational models for teaching about the environment; (3) stimulating interdisciplinary co-ordination and co-operation; and (4) adopting a more flexible teaching/learning relationship with the local community and environment;
- the advisability of defining more clearly the role in non-formal environmental education of programmes and activities involving youth and adults, such as literacy programmes, apprenticeships, professional retraining, family education, and so forth, many of which are being actively conducted in Member States;
- the advisability of more effective use of the mass media – radio, television and the press – in the field of environmental education both inside and outside the school system, involving the stimulation and production of appropriate programmes, the training of mass-media personnel in environmental matters and the co-ordination of the ministries and other organisms concerned, both government and non-government;

- the advisability of referring to current efforts conducted by many countries in research, experimentation and development of new methods, contents and instruments for environmental education.

5. *Regional and International Co-operation for the Development of Environmental Education*

The concluding section of the main working document describes the many co-operative efforts already undertaken and invite recommendations and guidelines for the future, particularly for the UN system as a whole and for the agencies most directly concerned about the environment, its problems and their educational solution, namely, Unesco and UNEP.

Lastly, participants at the Tbilisi Conference were asked to consider the recommendations they will have formulated as elements of an action plan for the promotion and development of environmental education regionally, internationally and globally.

B. *General Report*

The conference was opened by Unesco's Director-General Amadou Mahtar M'bow and welcomed by a message of greeting from Leonid I. Brezhnev, Secretary General of the Communist Party of the U.S.S.R. and Chairman of the Presidium of the Supreme Soviet of the U.S.S.R. Similarly participants were welcomed by Z.A. Pataridze, Chairman of the Council of Ministers of the Georgian S.S.R., host of the Tbilisi Conference. UNEP's Executive Director Mostafa K. Tolba then joined Mr. M'bow in an address to the participants before they began almost two weeks of working sessions.

After the opening ceremony, the Tbilisi Conference adopted the agenda outlined earlier.*

1. *Environmental Problems and the Role of Education*

Participants from all regions agreed that growing recognition of the implications and consequences of environmental problems must be coupled with an increasing awareness of solidarity among nations. Improved management of the environment to serve humanity should aim at reducing disparities, and at bringing about international relations based on equity, in the perspective of a new international order. Here environmental education has an evident role to play if all concerned are to acquire the knowledge,

*For full official text of all recommendations plus an annex of conference agenda, see *Final Report of the Tbilisi Conference*, available on request from the Canadian Commission for Unesco.

skills and social attitudes which can modify the existing situation for the better.

Moreover, models of growth and development must be reconsidered. It has become necessary to distinguish between the essentials and the "luxuries" for environment as well as development. This was considered another reason for a holistic approach to the study of environmental problems, which require the contribution of all natural, social and human sciences for their analysis and solution. Nor was their ethical dimension viewed as less important in any way.

One formal recommendation succinctly indicates the general conclusion: "The conference recommends that governments systematically evaluate the environmental impact of development activities, and requests that development assistance strategies and programmes provide opportunities for countries to establish environmental training programmes which include the evaluation of development from the standpoint of the human environment."

Another recommendation similarly spells out the conference's view of the role of education in the context of environmental problems and sound eco-development.

2. *Current Efforts*

National reports prepared for the conference and statements of the delegations testify to the significant advances made by a number of countries towards implementing environmental education programmes both inside and outside the school system. Important as these efforts and achievements may be – and participants gave encouraging evidence to this effect – there are still gaps and shortcomings. Less seems to have been achieved at the secondary level than at the primary level in schools both quantitatively and in terms of innovation. Little has been done for re-training out-of-school educators or in-service teachers in environmental matters. There are still far too few trained for the teaching of ecology or capable of effective participation in a multidisciplinary approach. Last, but most important, there still appears to be a considerable need for developing or refining overall environmental education strategies in all forms and at all levels of education.

3. *Strategies at the National Level*

To achieve the objectives of environmental education, the conference recommended that each country set up or strengthen the appropriate organizational structures, which could include representatives of educational and environmental

protection authorities, practising teachers at different levels, organizations concerned with environmental education and the mass media, etc., for the following functions: (1) to facilitate relations with Unesco, UNEP and other organizations involved in environmental education (EE); (2) to co-ordinate EE initiatives; (3) to serve as a consultative body in EE at the governmental level; (4) to play a role as a clearinghouse and information centre in EE; (5) to develop in various social and occupational groups an awareness and knowledge about the issues associated with EE in the country; (6) to promote collaborative relationships among EE associations, citizen groups and the scientific, research and education communities; (7) to provide frameworks and guidelines for the establishment of EE action committees within the country; (8) to assess the need for EE research, development and evaluation; and (9) to encourage and facilitate the contribution to EE programmes for non-governmental organizations, including voluntary bodies.

- a. *Programmes and curricula* – EE should not be just one more subject to add to existing programmes, but should be incorporated into programmes intended for all learners, whatever their age. A new joint pattern of work should be drawn up, involving home, community and school, to introduce young people to environmental issues. Environmental education should serve as a catalyst or common denominator in the renewal of contemporary programmes and curricula.

In this connection, the conference recommended that:

- subject disciplines identify and give priority to their special contribution to environmental education; and those responsible for the planning and implementation of general and vocational programmes encourage interdepartmental collaboration and co-ordination so that environmental goals and objectives may be achieved;
- responsible authorities support curriculum development as it relates to particular situations such as exist in urban areas, rural areas and areas of special historical and cultural importance, and to the needs of particular groups, such as farmers, industrial workers and parents;
- that institutions engaged in the development of curricula, teaching programmes and materials for EE study the problems linked with single subject, multidisciplinary and interdisciplinary approaches respectively; consider the suitability of each approach to different situations and learning groups; and identify the potentially most effective contribution of such subject areas as the natural sciences, the social sciences and technology;

- full and adequate emphasis be given to the teaching of ecological concepts, to the systems of the atmosphere, lithosphere, hydrosphere and biosphere and to relevant socio-economic aspects.

Educational programmes on the work environment, in the factory, field, office, mine, etc., received special consideration. It was recommended that: (1) curricula for specific trades and professions should include education concerning the work environment of the pertinent trade or profession, including information about medical standards for permissible levels of environmental pollution, noise, vibration, radiation and other factors affecting work conditions, as well as a system for monitoring their enforcement; (2) decision-makers, consultants and other key persons affecting the work environment should be educated on its problems and possible solutions; and (3) people on the job should be given the opportunity of acquiring similar knowledge about their particular work environment.

- b. *Methods* - In formal education, at all levels, account should be taken of all the ingredients of the education process (programmes and curricula, books and textbooks, teaching aids and resources, methods, etc.) and interdisciplinarity should thus be gradually achieved. The requirement is, without repudiating the existence and individual character of each traditional discipline, to avoid the over-analytical nature of subject disciplines and the differences stemming from their respective methodologies, which make it difficult for the learner to apprehend the environment: he often lacks a proper framework and, moreover, the usual approach by successive abstractions sets him at a certain remove from the subject under study. The solutions are thus:
- to introduce into each subject the essential environmental dimension;
 - to have curricula prepared by interdisciplinary teams;
 - to study practical problems, that is, the reality surrounding pupils and teachers.

The central idea is to attain, by means of growing interdisciplinarity and of prior co-ordination of disciplines, a practical education oriented toward a solution of the problems of the environment, or at least to make pupils better equipped for their solution by teaching them to participate in decision making.

The success of environmental education will not lie merely in bringing about a number of changes in the system and methods of education. This task requires the application of new concepts, new methods and new techniques as part of an overall effort stressing the social role of educational institutions and the establishment of

a new relationship between all those engaged together in the education process. To this end, legislative measures may be taken providing the State with a legal framework in which to draw up an environmental education system for the entire community.

Although environmental education should constitute one single organic and continuous process, each stage of this process has its own particular educative value.

In primary school, for instance, a few useful directions in which to promote environmental education would be: programmes of visits, the use of free time for activities in close contact with the environment, the development of a critical faculty and ability to see things in the round and the transcending of the cultural and scientific levels so as to gain an awareness of relations with the community and move towards solutions.

Secondary schooling should take the pupil on to a more ecologically, socially, politically and economically based application of ideas about the environment. University-level education should see the introduction, as a basis for all specialized courses (for engineers, architects, planners, economists, etc.), of thorough knowledge of the functioning of ecosystems and an insight into the socio-economic factors governing the relations between people and the environment, together with knowledge of the characteristics, limits and possibilities of the scientific and technical revolution.

In nonformal and out-of-class education, strategies for the introduction, promotion and development of environmental education depend on particular situations (e.g., rural setting or urban setting; occupations, socio-cultural background, etc.). They should be based on channels of social communication, on the mass media and on the various movements or associations. In addition to their special educational role, these activities are of vital importance since they make it possible to overcome many of the administrative or bureaucratic difficulties associated with formal education.

- c. *Teaching/learning materials* - In this category, participants recommended that:

- relevant authorities work out criteria on which to base the environmental content of the curricula to be offered to pupils and students according to individual needs and taking into account local, social, occupational and other factors; more specifically, basic principles should be formulated for the preparation of model textbooks and reading materials for use at all levels within formal and non-formal systems;

- in developing low-cost teaching aids and materials, the fullest use should be made of existing documentation, and educational research findings should be drawn upon, the value of existing teaching materials should be assessed and new teaching aids for environmental education should be developed as necessary;
- teachers and learners should be involved in the preparation and adaptation of instructional materials for environmental education;
- teachers in training should be given an understanding of as wide a range as possible of educational materials and aids, with special reference to low-cost materials and opportunities for adaptation and improvisation in local circumstances.

d. *Research, innovation and evaluation* - Similarly in this category, the recommendation of the conference to Member States is specific and detailed, namely, that:

- they develop national policies and strategies furthering environmental education research projects and incorporate their findings into the general educational process through appropriate courses;
- they carry out research concerning the goals and objectives of environmental education, the epistemological and institutional structures that affect consideration of environment der lands, and the knowledge and attitudes of individuals, in order to identify more precisely the most effective educational conditions, types of action by teachers and processes of assimilation of knowledge by pupils, as well as obstacles to the modification of concepts, values and attitudes held by individuals, and the use of these concepts, values and attitudes in relation to environmental behaviour;
- they undertake research concerning the conditions that foster development of environmental education, directed more particularly towards: identification of content, taking into consideration specific national and local features which might constitute an effective basis for educational programmes for those in and out of the formal education system as well as for specialists; the establishment of methodologies for the effective acquisition of the relevant concepts, values and attitudes by the various population groups, young and adult, receiving formal and non-formal education; and innovation in learning environments;
- they undertake research for the development of educational methods and curricula in order to sensitize the general public, particularly with regard to use of the mass media and the preparation of evaluation tools for assessing the impact of such curricula;

- they include in the courses of initial and in-service training of teachers, research methodologies for designing and developing methods and instruments which enable them to effectively fulfil the objectives of environmental education;
- they undertake research with a view to the design and development of purpose-built instructional systems, methods and materials enabling interdisciplinary environmental curricula to be developed. With this in mind, the possibility of using elements of the natural and social sciences and the arts as a basis for integration, should be studied;
- they undertake research in order to develop low-cost educational methods and materials enabling educators to train or retrain themselves on their own;
- they take steps to promote exchanges of information among national educational research bodies, the broad dissemination of research findings, and evaluation in the educational system;
- they undertake systematic analysis of educational experience and materials from external sources in order to determine their educational relevance and to bring them into line with local socio-economic, ecological and cultural conditions.

e. *Training of personnel* - Both pre-service and in-service training of teachers, planners, administrators and other key education personnel in environmental studies and concerns were stressed by conference participants. It was recommended that the staff of teacher education institutions be assisted in this regard; that the personnel educated receive environmental training related to the urban or rural area in which they are working or will work; and that such training be undertaken in close co-operation with professional organizations of teachers at both the national and international levels.

Stress was also laid on the importance of pre- and in-service environmental training of professionals, such as economists, business administrators, architects, planners, engineers, technicians and others whose activities, while not specifically in the field of environmental planning and management, nevertheless directly or indirectly have a major impact on the environment. It was recommended that their training include a common core of interdisciplinary environmental studies dealing with both the natural and social environments. In addition, special attention should be given to the development of suitable methodologies and institutional arrangements.

An effective method of such training would involve a problem-solving approach on an integrated, multidisciplinary team basis, since it develops professionals who, while retaining their original expertise, thus acquire an interdisciplinary

nary training and ability to work as members of multidisciplinary teams.

Similar but more intensive training was recommended for those working on specific problems of the environment, such as biologists, ecologists, hydrologists, toxicologists, soil scientists, agronomists, foresters, landscape architects, oceanographers, limnologists, meteorologists and sanitary engineers. An interdisciplinary component was considered indispensable for the training of these specialists. The reorganization of engineering schools and the incorporation of environmental education in the training of engineers was deemed an urgent need.

Special reference was made to environmental education in colleges and universities as centres for research and the training of qualified personnel. This meant development of appropriate teaching aids and textbooks and promotion of close co-operation among university bodies – departments, faculties, etc. – with the specific objective of forming experts in environmental education. Such co-operation might differ according to the structure of university education in each country, but should combine contributions from physics, chemistry, biology, socio-economic studies, ethics, education sciences, etc.

- f. *Information programmes and strategies* – Stressing the importance of the dissemination of specialized and general environmental knowledge and the development of public awareness of environmental issues, the conference recommended that Member States:

- implement and develop EE programmes for all sectors of the population, associating in the process, where appropriate, non-governmental bodies involved in environmental matters;
- establish or encourage the establishment of EE programmes in the formal and nonformal education sectors with the co-operation, where possible, of existing bodies and organizations, both public and private; develop the exchange of relevant materials and information between public bodies and private organizations concerned with environmental in either or both education sectors;
- support non-formal EE activities conducted by institutions and associations, including youth organizations;
- envisage public information campaigns on nationally and regionally relevant environmental problems, such as fresh-water resources, to promote the general education of the public, such campaigns to be conducted over the next few years by the various Member States acting so far as possible in a concerted fashion;
- include in their EE strategies the preparation of programmes which provide information on present or planned actions with major potential

impact on the environment, such programmes stressing the importance of participation by the general public and non-governmental organizations in the relevant decision-making process, and presenting different possible solutions to the problems in question, thus aiming at developing a responsible attitude on the part of participants;

- encourage and develop the organization of museums and exhibitions in order to increase public awareness of environmental issues and of environmental education itself.

- g. *Mass media* – In recognition of the particular importance of the mass media in environmental education, inside as well as outside the formal school system, the conference recommended that Member States:

- encourage the dissemination of knowledge about the protection and improvement of the environment by press, radio and television;
- organize training courses for journalists, newspaper editors, radio and television producers and other relevant mass media personnel, which will enable them to deal properly with environmental issues and education and to exchange among countries programmes and films dealing with environmental concerns;
- ascertain that EE programmes provide for suitable measures to ensure their reaching broad sectors of the urban and rural population not included in formal education programmes by, among other means, the mass media and with the participation of social institutions and organizations.

It was also recommended that Unesco, in co-operation with UNEP, encourage national, regional and international organizations to establish a network for the exchange of information on mass media materials for environmental education for each region.

4. *Regional and International Co-operation for the Development of Environmental Education*

Delegates considered that, if one of the aims of environmental education was to inculcate the spirit of responsibility and solidarity between nations, an awareness of economic, political and ecological interdependence, then overall co-operation at the regional and international level was certainly essential. They added that there was an equally essential need for sub-regional co-operation almost as everyday practice, since ecological and geographical proximity, linguistic and cultural affinities, similarities of socio-economic situations and community of views and interests provided a practical and effective

basis for joint action. The same delegates emphasized the need to go further, since sub-regional co-operation activities could only be disseminated by means of wider regional co-operation. Similarly, both the developing and the industrialized countries would benefit from increased international co-operation in environmental education.

All the delegates who spoke referred to information, training, research and experimentation on content, methods and teaching materials as among other fields where regional and international co-operation could and should make an effective contribution to the development of environmental education. As regards the main modalities for action, those which seemed to lend themselves most easily to co-operative action and which related to the various steps taken by governmental and non-governmental organizations were: exchanges of all kinds, at all levels, taking various forms, such as meetings, exhibitions, festivals, etc.; studies and surveys on innovations and activities for the general promotion of environmental education; projects, in particular pilot projects, intended for national groups or institutions working in both the formal and nonformal fields and aiming to test and develop environmental education innovations.

Delegates considered the question of means and instruments for the execution, in accordance with the main modalities indicated above, of regional and international co-operation activities. Delegates considered that effective co-ordination should be exercised at the international level to encourage, support and organize efforts and initiatives in the fields of exchanges of information, training activities for young and adult personnel or the preparation and testing of environmental education materials. It was considered that Unesco, by virtue of its competence, structures and experience, was suited for fulfilling this co-ordinating role and for giving a lead in international co-operation in environmental education. The role of co-ordinating international co-operation in environmental education which the Tbilisi Conference has entrusted to Unesco requires that the organization pursue and develop its own co-operation with the other agencies and programmes of the United Nations system, more especially the United Nations Environment Programme, whose functions in international co-operation in relation to the environment mark it out for primacy in this respect. As regards the question of structures, the great majority of delegates were, however, firmly opposed to the creation of new bodies, the need for and usefulness of which seemed doubtful in their view, for the implementation of international co-operation.

The importance of pilot projects to try out innovations and teaching materials was strongly emphasized, as was the impact of such projects on the environment and on the illiterate masses of certain countries. In regard to international projects implemented at national level, those conducted under Unesco's Man and the Biosphere Programme (MAB) were singled out for the attention of the conference by several speakers as examples to be followed.

Specifically, the conference recommended:

a. To Member States:

- to take all necessary action to implement in the broadest possible way and in accordance with the needs and possibilities of each nation concerned, the results of this conference on environmental education, and in this respect to draw up action-oriented plans and timetables for actions;
- to foster bilateral, regional and international co-operation within all branches of environmental education, based upon scientific research and a broad exchange of information and experience, co-operation on programmes, etc.;
- to facilitate comprehensive approaches to the solution of environmental problems within the jurisdiction of each country concerned by safeguarding the necessary prerequisites for environmental education - comprehensive or co-ordinated legislation, financial, organizational and other measures;
- to inform other Member States as well as the secretariat of Unesco about the time schedules, results, methods, etc., concerning environmental education and to forward to the secretariat of Unesco all materials in this respect which they would consider usable elsewhere;
- to extend the necessary advice in environmental education to other Member States or their organizations.

b. To Unesco:

- to establish a regular information bulletin (or service) aimed mainly at informing Member States about all actions on environmental education prepared for a given period by the secretariat of Unesco, by Member States or by organizations; and about new publications, research work, methods, experiences etc., in close co-operation with International Referral System (SIR) and other UN agencies;
- to foster international symposia, seminars, film-shows, etc., aimed at environmental education;

- to request the executive director of UNEP to support Unesco's actions in implementation of recommendations adopted by the Tbilisi Conference;
- to promote standing implementation of the Plan of Action, adopted by the United Nations Stockholm Conference on Human Environment, with further emphasis on environmental education.

The conference further recommended to Unesco:

- that it expand the field of its activities in environmental education and give it a greater role in future plans for the general area of education programmes and actions;
- that with the assistance of UNEP, it consider the possibilities of further development of the International Environmental Education Programme;
- that it expand the functions of its regional offices to enable them, in co-operation with Unesco National Commissions, to help: (1) develop or adapt instructional materials related to local environmental problems for use in the formal and non-formal education of primary and secondary school-age students; (2) create regional source books for environmental education which will foster and facilitate development of locally appropriate instructional materials; (3) encourage activities of youth groups and non-governmental organizations geared to improving and understanding of local ecosystems and environmental problems, taking into account urban as well as natural environments; (4) identify new and promising approaches to environmental education; conduct and evaluate pilot projects; systematically disseminate to other potential users those aspects of projects which are applicable; (5) provide educational opportunities to teachers and school administrators; (6) supply environmental education materials for use by the mass media; (7) conduct an expanded programme of pilot project research, documentation and evaluation in environmental education, and give wide dissemination of the results of these projects and similar activities through Unesco's environmental education publication (*Connect*);
- that it utilize existing institutions to receive, catalogue and disseminate materials useful in environmental education;
- that, in co-operation with UNEP, it develop model training courses, seminars, etc., on environmental and development issues for use by the UN organizations and others in the training of officials of the developing countries and those concerned with assistance to them. Existing international training institutes and programmes should expend their training curriculum to include subjects on basic ecological relationships,

impact assessment and establishment of effective institutional and regulator mechanisms;

- that it place more emphasis on the sharing of environmental experiences and remedial measures between developing countries;
- that it issue, on a regular basis, worldwide directories of environmental education organizations and personnel from existing information collected and compiled by Unesco;
- that it co-operate closely with non-governmental organizations and support their activities in environmental education;
- that, in co-operation with UNEP, it proclaim a specific environmental topic to be treated on a worldwide scale at appropriate intervals in consultation with relevant regional and international organizations.

5. *Roles, Objectives and Characteristics of Environmental Education*

The Tbilisi Declaration together with two of the recommendations of the conference constitutes the framework, principles and guidelines for environmental education at all levels – local, national, regional and international – and for all age groups both inside and outside the formal school system.

- a. The conference *recommends* the adoption of certain criteria which will help to guide efforts to develop environmental education at the national, regional and global levels:
 - whereas it is a fact that biological and physical features constitute the natural basis of the human environment, its ethical, social, cultural and economic dimensions also play their part in determining the lines of approach and the instruments whereby people may understand and make better use of natural resources in satisfying their needs;
 - environmental education is the result of the re-orientation and dovetailing of different disciplines and educational experiences which facilitate an integrated perception of the problems of the environment, enabling more rational actions capable of meeting social needs to be taken;
 - a basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and in the management of the quality of the environment;

- a further basic aim of environmental education is clearly to show the economic, political and ecological interdependence of the modern world, in which decisions and actions by the different countries can have international repercussions; environmental education should, in this regard, help to develop a sense of responsibility and solidarity among countries and regions as the foundation for a new international order which will guarantee the conservation and improvement of the environment;
- special attention should be paid to understanding the complex relations between socio-economic development and the improvement of the environment;
- for this purpose, environmental education should provide the necessary knowledge for interpretation of the complex phenomena that shape the environment, encourage those ethical, economic and esthetic values which, constituting the basis of self-discipline, will further the development of conduct compatible with the preservation and improvement of the environment; it should also provide a wide range of practical skills required in the devising and application of effective solutions to environmental problems;
- to carry out these tasks, environmental education should bring about a closer link between educational processes and real life, building its activities around the environmental problems that are faced by particular communities and focusing analysis on these by means of an interdisciplinary, comprehensive approach which will permit a proper understanding of environmental problems;
- environmental education should cater to all ages and socio-professional groups in the population. It should be addressed to (1) the general non-specialist public of young people and adults whose daily conduct has a decisive influence on the preservation and improvement of the environment; (2) to particular social groups whose professional activities affect the quality of the environment; and (3) to scientists and technicians whose specialized research and work will lay the foundations of knowledge on which education, training and efficient management of the environment should be based;
- to achieve the effective development of environmental education, full advantage must be taken of all public and private facilities available to society for the education of the population: the formal education system, different forms of non-formal education, and the mass media;
- to make an effective contribution towards improving the environment, educational action must be linked with legislation, policies, measures of control and the decisions that governments may adopt in relation to the human environment.

- b. The conference *endorses* the following goals, objectives and guiding principles for environmental education:

The *goals* of environmental education are:

- to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.

The categories of environmental education *objectives* are:

- Awareness: to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems.
- Knowledge: to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.
- Attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.
- Skills: to help social groups and individuals acquire the skills for identifying and solving environmental problems.
- Participation: to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

Guiding principles – environmental education should:

- consider the environment in its totality – natural and built, technological and social (economic, political, cultural-historical, moral, esthetic);
- be a continuous lifelong process, beginning at the pre-school level and continuing through all formal and non-formal stages;
- be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
- examine major environmental issues from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas;
- focus on current and potential environmental situations while taking into account the historical perspective;
- promote the value and necessity of local, national and international co-operation in the prevention and solution of environmental problems;

- explicitly consider environmental aspects in plans for development and growth;
- enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
- help learners discover the symptoms and real causes of environmental problems;
- emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
- utilize diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first-hand experience.

6. By Way of Conclusion

In his closing speech, Unesco's Director-General on the last day of the Tbilisi Inter-governmental Conference, 26 October 1977, suggested that the goals, objectives and guiding principles established for environmental education constituted "both a milestone and a starting point".

In this connection, a key passage from Mr. M'Bow's closing address might be quoted: "As an essential component of a global, lifelong, problem-solving education that prepares people for active participation, environmental education follows the guiding line which, in most countries, governs the movement of educational systems towards greater relevance, greater realism and better two-way contact between the physical and social environment in order to make humanity more closely involved with its surroundings." Thus, "environmental education perhaps represents an ideal opportunity to restore to education an ethical function it has sometimes lost and that educators in many countries... would like to see it recover, drawing inspiration from the needs and concerns of the contemporary world".

In summary, the Tbilisi Conference's recommendations "form the equivalent of an *action plan*" for the development of environmental education at the national, regional and international levels. As for Unesco itself, the Director-General pledged to intensify the organization's work in this programme area "in the light of the Conference's recommendations" and "to move into a more operational phase". This meant, *inter alia*,

"making aid from Unesco available to Member States which would like to launch pilot projects"; considering a 'bank' of experts on environmental education; augmenting "work in the exchange of experience in training and in encouraging the production of teaching materials"; and strengthening the secretariat and Unesco's infrastructure in general for the increased promotion of environmental education, particularly "the appointment of specialists in environmental education to the various regional offices and the establishment of training facilities or machinery for co-operation between Member States".

The urgent need for "action to protect the environment and perhaps even more for education to this end", was the essential appeal of the Tbilisi Declaration, an appeal, the Director-General had no doubt, "will be heeded".

C. The Tbilisi Declaration

The following is the text of the Tbilisi Declaration which was adopted by the delegates attending the conference in Tbilisi.

The Intergovernmental Conference on Environmental Education, organized by Unesco in co-operation with UNEP, convened in the city of Tbilisi, reflecting the harmony and consensus achieved there, solemnly adopts the following Declaration:

In the last few decades, man has, through his power to transform his environment, wrought accelerated changes in the balance of nature. The result is frequent exposure of living species to dangers which may prove irreversible.

The Declaration of the United Nations Conference on the Human Environment in Stockholm in 1972 proclaimed "to defend and improve the environment for present and future generations has become an imperative goal for mankind". This undertaking urgently calls for new strategies incorporated into development which, particularly in the developing countries, is a prerequisite for any such improvement.

Solidarity and equity in the relations between nations should constitute the basis of a new international order and bring together as soon as possible all available resources. Education, utilizing the findings of science and technology, should play a leading role in creating an awareness and a better understanding of environmental problems. It must foster positive patterns of conduct towards the environment and the nations' use of their resources.

Environmental education should be provided for all ages, at all levels, and in both formal and non-formal education. The mass media have a great mission. Environmental specialists, as well as those whose actions and decisions can have a marked effect on the environment, should be

provided in the course of their training with the necessary knowledge and skills and be given a full sense of their responsibilities in this respect.

Environmental education, properly understood, should constitute a comprehensive, life-long education, one responsive to changes in a rapidly-changing world. It should prepare the individual for life through an understanding of the major problems of the contemporary world, and the provisions of skills and attributes needed to play a productive role towards improving life and protecting the environment, with due regard given to ethical values. By adopting a holistic approach, rooted in a broad, interdisciplinary base, it recreates an overall perspective which acknowledges the fact that natural environment and man-made environment are profoundly interdependent. It helps reveal the enduring continuity which links the acts of today and the consequences for tomorrow. It demonstrates the interdependencies among national communities and the need for solidarity among all mankind.

Environmental education must look outward to the community. It should involve the individual in an active, problem-solving process within the context of specific realities and it should encourage initiative, a sense of responsibility and commitment to build a better tomorrow. By its very nature, environmental education can make a powerful contribution to the renovation of the educational process.

In order to achieve these goals, environmental education requires a number of specific actions to fill the gaps that, despite outstanding endeavours, continue to exist in our present education systems.

Accordingly the Tbilisi Conference:

- *appeals* to Member States to include in their educational policies measures designed to introduce environmental concerns, activities and contents into their educational systems on the basis of the above objectives and characteristics;
- *invites* educational authorities to promote and intensify thinking, research and innovation in regard to environmental education; and
- *urges* Member States to collaborate in this field, in particular by exchanging experiences, research findings, documentation and materials and by making their training facilities widely available to teachers and specialists from other countries.
- *appeals*, lastly, to the international community to give generously of its aid in order to strengthen this collaboration in a field which symbolizes the need for solidarity of all peoples and may be regarded as particularly conducive to the promotion of international understanding and to the cause of peace.

D. Canadian Delegation to Intergovernmental Conference on Environmental Education, Tbilisi

M. Yvon Beaulne, Head of Delegation, and Ambassador and Permanent Delegate of Canada to Unesco;

Honorable Gilbert Clements, Deputy Head of Delegation, Chairman of the Canadian Council of Resource and Environment Ministers, and Minister of the Environment, Province of Prince Edward Island;

M. Guy Choquette, Counsellor, Canadian Embassy, Moscow;

Mr. Fred Dawes, Special Advisor on Human Settlements, Canadian International Development Agency;

Dr. Harry K. Fisher, Assistant Deputy Minister, Ministry of Education, Province of Ontario;

Dr. George Francis, Faculty of Environmental Studies, University of Waterloo;

Dr. John Hurnard, Executive Director, Development Division, Department of Education, Province of Saskatchewan;

Dr. Michel Maldague, Faculté de Foresterie et de Géodésie, Université Laval;

Ms. Colette Cloutier, Canadian Embassy, Moscow.

E. Main Working Document for the Tbilisi Conference

We are reproducing in Appendix VI the first two chapters of the main working document for the Tbilisi Conference. Chapter I deals with the major environmental problems in contemporary society and the relationship between these problems and socio-economic and cultural development. Chapter II defines the role of education in facing the challenge of environmental problems and the objectives and characteristics of a type of education which can give effective help in trying to prevent these problems arising and to solve them when they do arise.

A limited number of the complete working document (ref. Unesco/ENVED 4) is available in English and French from the Canadian Commission for Unesco. The document contains 3 additional chapters: Current efforts at the national and international levels for the development of environmental education; strategies for the development of environmental education at the national level; regional and international co-operation for the development of environmental education.

Appendix I

United Nations Environment Programme (UNEP)

1. Introduction

The United Nations Environment Programme has its origin in the United Nations Conference on the Human Environment which was held in Stockholm, Sweden, in June 1972. The conference had been convened to bring to the attention of governments and the people of the world evidence that man's activities were damaging the natural environment and were giving rise to serious risks for the survival and well-being of man himself. The Stockholm Conference thus provided the basis for co-operative action to deal with the challenge of environmental problems.

2. UNEP Governing Council

The United Nations Environment Programme Governing Council consists of 58 Member States elected by the General Assembly for three-year terms on the following basis:

African states: 16 seats;

Asian states: 13 seats;

Latin American states: 10 seats;

East European states: 6 seats;

Western European and other states: 13 seats.

The Governing Council is UNEP's policy-making body. Its functions and responsibilities are:

- (a) to promote international co-operation in environment, as appropriate policies to this end;
- (b) to provide general policy guidelines for the direction and co-ordination of environmental programmes within the United Nations system;
- (c) to receive and review reports of UNEP executive director or implementation of environment programmes within the United Nations;
- (d) to keep under review the world environmental situation;
- (e) to promote the contribution of relevant scientific/professional institutions, assessment and exchanges of environmental knowledge;
- (f) to maintain under continuing review the impact of national and international environment policies and measures on developing countries, costs, etc.;
- (g) to review and approve annually, ways in which resources of the environment fund are used.

A major objective which was agreed upon by the first Governing Council (1975) is that the fundamental task of the programme should be

the identification of major environmental problems through environmental assessment, the promotion of solutions to them through environmental management activities and supporting measures including:

- (1) technical assistance to governments in promoting environmentally related measures;
- (2) aid to train personnel requiring specialized skills;
- (3) all forms of aid including financial, to strengthen national and regional institutions;
- (4) relevant material to support public information and educational programmes on environment.

3. The Environment Co-ordinating Board

The central mechanism for co-ordination within the United Nations system, by UNEP is the Environment Co-ordination Board. It was established under the chairmanship of the executive director, and within the framework of the United Nations' Administrative Committee on Co-ordination. The ECB is composed of heads of organizations within the United Nations system, other United Nations bodies and the Regional Economic Commissions. The main purpose of the board is to ensure a co-ordinated approach by the entire United Nations system to environmental issues and its main role to serve as a forum for inter-agency consultation and co-ordination relating to the United Nations Environment Programme; it is thus the primary means whereby UNEP co-ordinates and influences the programmes of the United Nations agencies and vice versa. To facilitate these processes, the board has established groups or task forces to examine specific areas of the programme such as Earthwatch. The members of the ECB on the one hand and UNEP on the other have designed focal points to maintain liaison among themselves, and to prepare for the work of the ECB itself.

4. Principles of Action and the Programmatic Process

UNEP is charged with a co-ordinating role throughout, and to some extent, beyond the United Nations system. In fact, the main reason for UNEP's existence is to promote co-ordination among national and international organizations and to encourage them to give due emphasis to the environment in their deliberations. UNEP is therefore required to identify the problem and develop a programme for implementation by members of the United Nations system and where appropriate, by national governments and other international bodies.

An aspect of UNEP's co-ordinating role is its catalytic function which is aimed at spurring others into action. This is often carried out with support from the environment fund, as well as through other means. The executive director of UNEP further explained UNEP's role (at the United Nations General Assembly's 29th session, 1974):

"... UNEP approaches its own role on the premise that environment is not an issue of discipline separate and apart from others, but a new dimension which must be brought to bear on the whole range of activities, which bear on the health of the environment".

Thus the United Nations Environment Programme was not created to assume responsibility for a new sector called "environment", but to help strengthen the environmental dimension in a great variety of activities carried out by other international organizations, principally those within the United Nations system. This requires a new approach to co-ordination and co-operation within the United Nations family and with other intergovernmental organizations, with the scientific community and with especially interested groups, such as industry.

Therefore, the essence of UNEP's role is that of "catalyst", "initiator", and "co-ordinator" in the areas covered by environmental concerns; and the comparatively modest fund of the small Secretariat of UNEP is used to support this role. Under the guidance of the Governing Council a programme has evolved which both provides an overview of the broad spectrum of activities which affect the environment and concentrates the resources and energies on a relatively few priority areas of particular importance.

5. Education and Training - Essential Elements in the United Nations Environment Programme

The ultimate goal of the environment programme is to stimulate action that would lead to sound environmental management. Education and training are indispensable tools for reaching this goal. Concern for the well-being of mankind and for the natural resources, including the innumerable species of animals, plants and micro-organisms on which human life depends, requires new motivations, new attitudes and new thinking towards environmental balance. The creation of environmental awareness, the acquisition of fresh insights and the development of new skills on a massive scale are an educational task, since effective environmental management will depend upon a well-informed public, environmental education becomes the lunch-pin of orderly and sound development.

For such an ambitious job, there must be a new approach to education at all levels, includ-

ing formal, non-formal and informal arrangements. This in turn demands that educational systems be redirected so that the environmental dimension is included in all educational curricula, teaching materials and methodologies, thus building up a lifelong educational process which would provide the knowledge and the will to protect our environment and conserve our limited resources. The catalytic and co-ordinating role of UNEP finds practical application in this vital area of environmental education and related training.

UNEP's approach to environmental education and training is based on two conceptually simple interpretations:

- (1) education - for establishing sensitivity to environmental problems, raising the level of awareness and generating commitment;
- (2) training - for development and mastery of skills, for solving practical problems and for specialized action.

These two "elements" belong to a continuous spectrum containing a broad middle band in which the two overlap:

- Environmental education is generally applicable to the education of all citizens and should be directed at people of all ages, in all types and categories of formal education - including pre-school, primary, secondary and tertiary, and non-formal education for out-of-school youth and adults. The purpose of such education is to produce an environmentally literate citizenry who will have the basic knowledge of, and concern for, environmental problems, awareness of the implications of these problems, basic skills to cope with and initiate elementary solutions, motivation and commitment to the measures of environmental management.
- Environmental training is applicable to a special group of persons - i.e., specialists and technicians - who have to undertake assessment and management tasks. For these people it provides specialized knowledge, advanced skills, techniques and expertise necessary to handle and solve environmental problems, effective utilization of natural resources and to protect and restore the quality of the environment.
- Environmental education and training of particular professional or social groups lie in that overlapping portion of the education-training continuum in which education for increased understanding of environmental problems is just as important as, and takes place simultaneously with, training for competence in those areas of technical and professional practice which carry important implications for, or have direct bearing, on environmental concerns. The target group for this type of integrated (education-training) activity include engineers, architects,

town-planners, doctors, lawyers, economists, planners, industrialists, policy-makers and decision-makers.

6. Environmental Education as a Supporting Measure in UNEP

UNEP's concept of environmental education as a means of helping individuals obtain an understanding that man is an inseparable part of an environmental system, is based on the view that the process by which people develop knowledge, skills and motivation related to the environment should be education which is experience-based, pragmatically focused and problem-oriented. The principle established in Stockholm (1972) was that this kind of education in environmental matters – for the young generation as well as for adults, giving due consideration to the underprivileged – is essential to broaden the basis for enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and improving the environment.

UNEP's first Governing Council session in 1973 called for assistance to all countries, especially developing ones, to deal with their environmental problems and to help mobilize additional financial resources. This was for the purpose of providing the required technical assistance, education, training and free flow of information and exchange of experience, so as to promote the full participation of developing countries in the national and international efforts for the preservation and enhancement of the environment.

The second Governing Council in 1974 emphasized the importance of designing curricula and developing an overall international framework in all activities in environmental education.

The third Governing Council in 1975 gave authority to consider environmental education as a high priority area, and agreed upon the objective strategies for their supporting measures.

Objectives

- (1) To effect a rapid and systematic development of environmental education on a global basis;
- (2) to create environmental awareness at the highest policy levels and hence at the levels of decision-making in all sectors of development, in both the public and the private context, will be major objectives;
- (3) to provide the education and training necessary to make it possible for all countries to be able to participate in all appropriate parts of the rest of the programme in an informal manner as equal partners;

- (4) to establish means of inducing policy-makers, decision-makers, and administrators in the governments of all countries to include environmental dimensions in the consideration of their policies, programmes and projects.

Summary of Strategy

- (1) Stimulation of education and training through institutions of excellence, regional programmes (seminars, symposia, etc.);
- (2) activities relating to the development of new curricula, teaching materials, information systems, etc.;
- (3) development of instruments such as fellowships, institutional linkages, funding and, on an experimental basis, a programme activity centre for environmental education and training.

Concentration Areas

The fourth session of the Governing Council (1976) agreed upon certain concentration areas for the environment programme; those for environmental education are:

- (1) Implementation of the programme of environmental education jointly with Unesco;
- (2) establishment of a programme activity centre for environmental education and training.

7. Environmental Training as a Supporting Measure in UNEP

In the context of the United Nations Environment Programme, training for environmental competence is an essential element in the process of skill development.

Environmental training is, therefore, a supporting measure for the functional tasks of environmental management. Unlike environmental education, which aims at an environmentally literate citizenry, environmental training focuses on special skills and techniques for dealing with specific environmental problems. It is recognized, however, that environmental education and training belong to a continuum in which considerable overlap occurs and the dividing line between the two is very imprecise. Thus, environmental training for whatever skills includes at the same time some elements of education (knowledge, acquisition and attitude formation) although it is immeasurably facilitated by on-the-job experiential learning.

Training components are included in most of UNEP's programming activities. Once problems are located and gaps in knowledge or skill identified, researches are carried out to provide new knowledge and insights, while pilot projects are used as a basis for testing new solutions, methodologies and approaches. The ultimate

Appendix II

The International Environmental Education Network

phase in this programme continuum consists of training programmes to generate the skills, expertise and manpower development necessary to apply these new solutions, methodologies and techniques to the problems of environmental assessment and effective environmental management.

Programme Objectives

- (1) To provide training in specific areas of policy, programming and implementation of national and regional development plans based on properly developed methods including environmental dimensions;
- (2) to provide the education and training necessary to make it possible for all countries to be able to participate in all appropriate parts of the rest of the programme in an informed manner as equal partners.

Summary of Strategy

- Training for officials, planners, decision-makers, specialist and other groups;
- stimulation of education and training through institutions of excellence, regional programmes (seminars, symposia, etc.);
- development of instruments such as fellowships, institutional linkages, funding and, on an experimental basis, a programme activity centre for environmental education and training.

Concentration Areas

- Establishment of a programme activity centre for environmental education and training;
- conduct of, and support for, training programmes on a regional basis, particularly of personnel from developing countries involved in planning and management of various aspects of development which have an important environmental dimension.

For further information, write to:

United Nations Environment Programme
(UNEP)
P.O. Box 30552
Nairobi
Kenya

Recognizing that the exchange of information is central to the success of environmental education on a global level, Unesco has underway a project to establish an International Environmental Education Network in co-operation with the International Referral System (IRS) of UNEP.

Objectives of the network system are: (1) to encourage the exchanges of information, ideas and experiences among those recorded in the network; (2) to link individuals and institutions providing services, publications and materials with those who have expressed needs; and (3) to facilitate the task of the International EE Programme in co-ordinating international environmental education activities.

The first phase in the creation of the network system is the ongoing identification of individuals and institutions engaged in environmental education, the collecting of detailed information on their activities, needs and services, and the computerizing of the collected data. The stored information will be retrieved and published as an international reference book on environmental education resources - individuals, institutions, periodicals, funding bodies, etc.

The second phase will involve storage of information relating specifically to environmental education programmes and documents in the computer, so that bibliographies, abstracts, programme descriptions and the like may be easily retrieved and made available, probably as published printouts.

The third phase envisages selection of specific institutions in every region of the world to identify new (and revise existing) environmental education information and to assist in its diffusion. Overall co-ordination will be exercised by Unesco.

If you and/or your institution are interested in being considered for inclusion on the list of the Unesco environmental education network, you could obtain a copy of the questionnaire from:

Mrs. S. Romero Lozano
Chief
Environmental Education Programme
Division of Science, Technical and
Vocational Education
Education Sector
Unesco
7, place de Fontenoy
75700 Paris
France

Appendix III

Unesco's Man and the Biosphere Programme

1. A New Approach

Unesco's Man and the Biosphere Programme (MAB) represents a new, integrated approach to research, training and action aimed at improving man's partnership with the environment.

MAB seeks to break down the obsolete barriers between natural scientists, human and social scientists, decision-makers and offers instead an interdisciplinary, problem-oriented approach to the management of natural and man-modified ecosystems.

Environmental problems do not stop at national boundaries, and experience in solving them should be shared. Regional and global solutions must be found for problems formerly tackled only within the national context.

MAB proposes a systems approach based on the co-operative efforts of countries sharing common problems under comparable ecological conditions.

2. The Beginnings

MAB was officially launched in 1970 at the 16th session of the General Conference of Unesco and the broad outlines of the programme were established in November 1971 at the first session of the MAB International Co-ordinating Council which proposed 13 project areas for co-operative research. A 14th project, on environmental pollution, was added at the 18th session of the General Conference in 1974.

Endorsed by the United Nations Conference on the Human Environment, in Stockholm in 1972, MAB enjoys the continuing support of the recently established United Nations Environment Programme. The UN specialized agencies concerned, as well as the international scientific community, take part in its planning and implementation.

MAB is in some respects a follow-up to the former international Biological Programme (IBP) and has drawn heavily on the experience gained by the IBP. MAB differs from IBP, however, in that it is intergovernmental in structure and it is oriented towards actual management problems arising from the interactions between human activities and natural systems.

After three years of international preparation and planning, many research activities within the 14 project areas are now being implemented.

3. The Way MAB Works

The MAB International Co-ordinating Council, consists of scientific representatives from 25 nations, selected every two years by the Unesco General Conference, along with representatives from appropriate United Nations and non-governmental organizations. It guides and supervises the programme. Unesco provides the secretariat.

In each country a national committee defines and organizes research activities on particular national problems which relate to the international programme. Special working groups and expert panels are set up by the council to co-ordinate national contributions and to define international core programmes ensuring that compatible methodology is used for the various projects.

Thus, countries work together on a series of problems of common concern so as to provide comparable results capable of generalization and synthesis.

Since the major focus of MAB projects is concerned with man's interactions with particular ecosystems or geographic units, much of this co-operative work is being developed at the regional and sub-regional levels.

For information on the major MAB projects areas, on projects being undertaken in Canada and on MAB publications, kindly contact:

Dr. Patricia Roberts-Pichette
Executive Secretary
Canadian MAB Programme Secretariat
Fisheries and Environment Canada
Ottawa, Ontario
K1A 0H3

Appendix IV

Statement by the International Union for Conservation of Nature and Natural Resources (IUCN) at the Tbilisi Conference

1. Introduction

The Inter-governmental Conference on Environmental Education organized by Unesco in co-operation with UNEP is an important response to the need for better education about environmental matters. The many activities and meetings conducted in preparation for this conference have provided a wealth of valuable information for the assembled governmental delegates and observers from non-governmental organizations. Environmental education has moved into a new and challenging phase in its development with the convening of this intergovernmental meeting; the expertise of those assembled not only from environmental fields, but also from the broad area of education, is testimony to the increased concern about matters of environmental quality all over the world.

Among the many organizations working on environmental matters is the International Union for Conservation of Nature and Natural Resources (IUCN) with its headquarters in Morges Switzerland, is a union of sovereign states, government agencies and non-governmental organizations joined together to promote the wise use of natural resources throughout the world. The Union was founded in 1948 at a meeting convened by Unesco and the Government of France. At present IUCN has 424 voting members in 102 countries, these members being States (48), government agencies (109) and non-governmental organizations (267).

It is, therefore, a powerful force in mobilizing world-wide opinion and has unusual advantages in that, as an NGO (non-governmental organization) having states as members, it can influence policies through both formal and informal channels.

Its role is that of a strategist in certain chosen fields; surveying problems, identifying what needs to be done and what is possible, setting priorities and developing programmes and projects to be requested by the countries concerned and to be funded by others; by UN agencies, bilateral aid or through the World Wildlife Fund. It also plays an important part in stimulating public awareness and promoting action among its members.

In the development of its programmes IUCN relies heavily on six commissions of scientists and other specialists. The commissions evaluate problems and help shape programmes to deal with them. One of these commissions is concerned with education. Its mandate is to promote education and information that will increase public awareness of and involvement in natural resources issues. IUCN works closely with a number of international agencies and organizations in carrying out its activities. Especially close is the World Wildlife Fund (WWF). WWF was founded in 1961 and is also located in Morges. It is an international charitable organization dedicated to saving the world's wildlife and wild places. IUCN advises WWF on broad conservation strategy and provides the scientific planning and evaluation for WWF projects.

IUCN also has close working relationships with the UN system and particularly with Unesco and UNEP. UNEP provides the union with substantial assistance to enable IUCN to carry out more effectively strategic planning and co-ordination for species and ecosystem conservation. There are close ties with Unesco in various programmes and there has been considerable cooperation with both agencies in the various stages of the International Programme on Environmental Education. IUCN served as the only NGO representative on the Programme Advisory Committee during the conceptual and developmental stages leading to this conference.

2. Education and the Challenge of Environmental Problems

IUCN considers this conference most timely. Like most other social institutions, educational systems were unprepared to cope with the decline in environmental quality which thrust itself on the public consciousness less than a decade ago. But that is understandable, since there were no quick answers to the complex social, cultural, scientific and economic questions that arose from that situation. Now, through the activities of the Unesco/UNEP program, there has been a confirmation of the need for education to embrace new perceptions and practices in order to provide the appropriate attitudes and skills to resolve the world's critical environmental issues. For many years there have been a few exemplary programs in environmental education. It was, to a large extent, the scattered efforts of a few non-governmental organizations that first stimulated educational responses to environmental and conservation matters. Until recently there has not been a significant emphasis on bringing this experience together in an integrated manner.

Even in the early stages of the environmental "movement" the need for action with respect to education was fully recognized, but with the seemingly endless list of environmental crises demanding immediate remedial action, environmental education received a relatively lower priority. The enormous complexities involved in affecting educational change limited the amount of effort that could be directed to this admittedly important area. But the level of activity has continued to increase in response to the perceived needs of various nations around the world. These increased efforts have now reached a level from which it is possible to re-examine the objectives and strategies of environmental education. This then, from the view point of IUCN, is the purpose of this Inter-governmental Conference on Environmental Education.

IUCN is obviously concerned with precise articulation of objectives that will respond to the most significant needs in environmental education (defined in its broadest sense as it is in the background papers prepared for this conference), and with the development of strategies for their achievement that are economically and socially feasible.

3. The IUCN Role in Environmental Education

But the role of the IUCN family must be tailored to its more limited mandate and resources. The strength of the IUCN is that it forms a unique, international network for communication and collaboration on conservation and environmental matters.

The Commission on Education, whose membership comes from 24 countries around the world, is the body that has specific responsibility for stimulating and assisting environmental and conservation education activities around the world. In order that these activities can be conducted in a manner that is optimally responsive to local, national and/or regional needs and priorities, IUCN, under the umbrella of the commission, is creating a network of national and regional committees, and task forces. This method of operation places the commission in close touch with the wide variety of events and activities occurring under different conditions and responding to different needs; it also aids in the assessment of trends in environmental education and enables the commission to be an effective catalyst.

Under IUCN's programme procedures, each regional or subject area program includes an appraisal of the conservation situation, which amongst other things will identify those factors impeding progress in conservation. Where it is the attitudes and/or the lack of knowledge of decision-makers, opinion leaders or local communities that impedes conservation, steps will be taken to develop an education or public awareness project in conjunction with the primary project. It may well be that IUCN, through appropriate staff, consultants, and the Commission on Education, will assume a purely advisory rather than action role in any particular project. But in any event, it will ensure that the situation is assessed and appropriate action taken.

In order to make optimum use of the limited human and financial resources available to the Union, it is obviously necessary to focus IUCN's activities in the field of education and communication.

The areas on which IUCN will focus are:

- non-formal education and communication;
- informing key decision-makers and opinion leaders;
- stimulating activities in both formal and non-formal education by setting up national and regional committees and task forces.

It is anticipated that this selectivity will result in IUCN's education efforts complementing the programs of other agencies, organizations and governments. Wherever possible, education projects will be conducted in close co-operation with existing agencies and organizations. The new focus on non-formal education and communication with key decision makers and opinion leaders (e.g., government officials, religious leaders, senior education ministry staffs, etc.) should create a coherent program to meet the needs of those people.

The receptivity of different communities to different arguments and modes of presentation varies considerably. Therefore, IUCN's non-formal communication projects will concentrate on simple presentations of facts and arguments in a form that is easily convertible to national or local styles. Such presentations will normally be supplied to national or local organizations so that they can educate and inform the people in their own countries rather than IUCN attempting to do so direct. At the same time IUCN intends building a body of experience - of explicit assumptions about the effectiveness of various education materials and methods in various contexts, well-tested and reported - together with a file of communication materials and case-histories; so that IUCN's advice can be more precisely attuned to the needs and conditions of different peoples throughout the world.

Each of IUCN's regional and national committees and task force groups will function in a manner that is most responsive to locally perceived needs and priorities. The tasks that they undertake may, therefore, cover the full gamut of recommendations and guidelines developed at the Intergovernmental Conference. The regional groups will assist the Commission of Education in the continuing assessment of areas of greatest need at the international level; and they will cooperate, at the national and regional levels in carrying out projects that respond to those identified needs. This is important, for it is at the local level that the international dimension begins.

In closing this statement, it is worth stressing that environmental education is more than a response to current environmental crises and distortion. It can be based on a positive philosophy of eco-development; it can respond to the requirement to meet basic human needs and elevate the quality of life; it can stimulate and facilitate a multi-disciplinary approach to planning and the assessment of development alternatives. It need not be a litany of negative pronouncements against environmental malpractice. It can be an affirmation of how to live.

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Appendix V Acronyms

ADI	Asian Development Institute
ALECSO	Arab Educational, Cultural and Scientific Organization
CERI	Centre for Educational Research and Innovation
CIAT	International Centre for Tropical Agriculture
ECA	Economic Commission for Africa
ECB	Environmental Co-ordination Board
ECLA	Economic Commission for Latin America
EE	Environmental Education
EMASAR	Ecological Management of Arid and Semi-Arid Rangelands
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization of the United Nations
GARP	Global Atmospheric Research Programme
GEMS	Global Environmental Monitoring System
IAEA	International Atomic Energy Agency
IATED	Inter-Agency Task Force on Data
IBPGR	International Board for Plant Genetic Resources
ICIPE	International Centre for Insect Physiology and Ecology
ICRO	International Cell Research Organization
ICSU	International Council of Scientific Unions
IGCP	International Geological Correlation Programme (Unesco)
IHP	International Hydrological Programme (Unesco)
IITA	International Institute of Tropical Agriculture
ILC	International Labour Organization
IMCO	Intergovernmental Maritime Consultative Organization
IOC	Intergovernmental Oceanographic Commission (Unesco)
IPAL	Integrated Planning on Arid Lands
IPEME	International Programme in Environmental Management Education
IRPTC	International Register of Potentially Toxic Chemicals
IRS	International Referral System for Sources of Environmental Information (UNEP)
IUCN	International Union for Conservation of Nature and Natural Resources

Appendix VI

Main Working Document for the Tbilisi Intergovern- mental Conference on Environmental Education

A. Chapter I Major Environmental Problems in Contemporary Society

1. This first chapter is meant to serve as a frame of reference for the discussions and recommendations of the conference on the role of education in understanding, solving and preventing environmental problems and on the framing of strategies that will enable education to perform this role as effectively as possible. Although the conference is not required to enter into the details of environmental problems, it appeared necessary to give a brief account at the outset of the subjects of concern that have given rise to the need to develop environmental education. The ideas expressed below are based on the concepts worked out at the United Nations Conference on the Human Environment (Stockholm 1972) and the lines of thinking developed by UNEP and Unesco, as reflected in their respective programmes of activities and various official publications.

Nature and Causes of Environmental Problems

2. Interaction between man and the "environment" has existed since humans first appeared on earth. Such interaction is an intrinsic aspect of human development, which has been achieved by a process of social and cultural evolution in which education has played an essential part. Man's capacity to adjust his relationship with the natural and the man-made (i.e., social and cultural) environment, and to transform the environment itself has passed through various phases. In this connection the fundamental factor that distinguishes modern society from preceding societies is the accelerating pace of the changes caused in the environment by the scientific and technological revolution, the massive scale of those changes and the universality of some of their consequences. This situation necessitates, in every country and in the world at large, a profound awareness of the problem and the adoption of measures such as will bring about a new relationship between men and between man and his natural environment. *Education must play an essential part in promoting the development of new patterns of individual and collective behaviour in these domains.*

MAB	Man and the Biosphere Programme (Unesco)
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
SCOPE	Scientific Committee on Problems of the Environment (ICSU)
SEPA	Science Education Programme for Africa
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHHSF	United Nations Habitat and Human Settlements Foundation
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
WFP	World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organization
WWF	World Wildlife Fund

3. The environment can be considered as the whole set of natural and social systems in which man and the other organisms live and from which they draw their sustenance. This concept embraces the natural and man-made resources and products whereby human needs are satisfied. The natural environment is made up of four interlocking systems: the atmosphere, the hydrosphere, the lithosphere and the biosphere. Even without any human interference, this set of natural elements is constantly changing; but the nature and rhythm of such change are considerably influenced by human activities. The social environment includes human groups, the material infrastructures built by man, and the production relations and institutional systems that he has devised. The social environment shows the way in which human societies have organized themselves and how they function in order to satisfy, first of all, needs relating to food, shelter, health, education and work. When, in certain societies, these basic needs have been met, man pursues more ambitious aims: drawing on his experience, the lessons that science has taught him and the tools that technology offers him, and spurred on by his thirst for progress and novelty, he has sought greater fulfilment in the twofold pursuit of intellectual and spiritual enrichment and material comfort.
4. Man's pursuit of the satisfaction of his various needs, coupled with rapid population growth, has resulted in increased pressure on the natural environment, either directly, through the consumption of its resources, or indirectly, by outstripping its capacity to assimilate the waste products of human activities. The same thing has happened with the social environment, wherein the use and distribution of the products of human labour and the forms of social organization at the national and international levels have, in many instances, reduced large sectors of the population to poverty and cultural alienation. In certain cases, demands have been so extravagant that they threaten the balance of the biosphere on a universal scale, as could happen in the case of the ozone layer or, on a more localized scale, as when the marine systems that provide the livelihood for the inhabitants of certain regions are menaced by pollution or when daily life in certain great conurbations is subject to various kinds of stress as a result of such things as congestion, the destruction of townscapes, discrimination in the allocation of housing, "hidden persuasion" by advertising, etc.
5. The major environmental problems confronting society may be analysed in terms of, for example, the extent of the geographical zones affected, the type of biological, physical and social problems that arise or the nature of the problems that different types and rhythms of development may give rise to.
6. Some of these problems, such as the impact of human activities on the climate, have worldwide consequences. Others, although confined to certain parts of the earth's surface, also have global effects as, for example, the shrinkage of the equatorial forests and the destruction of certain species of wildlife. Others again are of regional importance while a number of problems are of an essentially national or local character, such as the quality of certain human settlements.
7. Environmental problems exist in all countries and at every stage of economic development. Some of these problems – problems very diverse in character – are common to a large number of countries; but environmental problems often arise in very different forms from one country to another and some occur more frequently either in certain developing countries or in certain industrialized nations. Many developing countries experience environmental problems of two types, those due to underdevelopment and those arising from certain modes of development. Poor living conditions as regards health and nutrition in certain human settlements, complete vulnerability to natural disasters, the destruction of forest resources, declining soil productivity resulting from the use of unsuitable farming methods, or low labour productivity due to illness and malnutrition are very often linked with underdevelopment.
8. Some developing countries, even though enjoying the initial advantages of development, also at times suffer undesirable environmental effects because inappropriate measures have been adopted. Within this context, development strategies which seek to maximize profits and are based on short-term piecemeal planning, often prove ill-suited for preserving the balance of natural ecosystems. There are many examples of deterioration in the quality of the environment as a result of badly designed development strategies. These have frequently led to the rapid depletion of certain resources, or increase in the various types of pollution and the spread in several countries of diseases linked with environmental deterioration.
9. Many industrialized countries are also faced with complex problems due to the fact that scientific and technological innovations have been introduced *without taking fully into account* their repercussions on the environment. Industrial pollution, overexploitation of resources and the social and cultural problems that characterize life in the big cities are examples of the difficulties that the industrialized nations have to cope with, difficulties that have already become or may become subjects of concern for the developing countries as well.

10. When development programmes are badly designed – whether in the developed or the developing countries – their repercussions on the environment generally fall into the following categories: the *deterioration of resources* – a decline in the quality or quantity of mineral resources and those of the land, forests, oceans, etc.; *biological pollution* by agents causing disease in man; *chemical pollution* due to air pollutants, pesticides, detergents and similar agents; *physical pollution* such as thermal pollution, silting, noise and visual blight.
11. Alternatively, the effects of badly designed development policies can be divided into two main categories, encroachment effects and depletion effects. *Encroachment* effects may impair productivity levels or affect mental, social or physical well-being. They are the result of changes in the natural or social environment such, firstly, as air and water pollution or contamination of the soil and, secondly, conflicts between social groups, economic and cultural discrimination, etc. Natural ecosystems and social systems too have a great, but not unlimited capacity for absorbing the various pressures brought to bear on them, but beyond certain thresholds serious environmental problems may arise. *Depletion* effects occur when an activity reduces the stock of resources available for the future. Wasteful or irrational methods of production or utilization of resources accelerate the depletion rate: the irresponsible wastage of fossil fuels, for instance, is a source of considerable concern, giving rise to fears that world reserves may not last more than a few decades.
12. However we approach environmental problems, they cannot be forestalled or solved by seeking purely technological solutions; technological skills are, of course, essential but we must also, and above all, strike at the socio-economic roots of these problems. Socio-economic patterns have a vital influence on the protection and development of the natural and social environments. Here again, the constraints that are placed upon migration between, or within countries and those associated with international trade or the indiscriminate transfer of technology can make it all the more difficult to correct the discrepancies between population growth and the volume of available resources.
13. Poverty and failure to satisfy human needs may lead men to commit such desperate acts to ensure their survival that they may cause irreparable damage to the natural environment in which they live. The exhaustion of nutrients in the soil through over-grazing of marginal land and the radical destruction of forest resources because of the pressing need for fuel are examples of the damage caused to the environment as a result of poverty. Conversely, the deterioration of the natural environment, e.g. the spread of deserts, may bring about, or increase poverty. The relationship between poverty and the deterioration of the natural environment thus works both ways and appropriate measures should be taken beforehand to forestall its effects.
14. The disparity in the living standards of different countries means that the mechanisms governing the use of resources operate to the advantage of the richer nations. Similarly, flagrant inequalities in income distribution within countries and in the national control of resources militate against the use of natural resources in such a way that society as a whole will benefit. What is more, these inequalities may aggravate environmental deterioration, as when certain privileged groups waste energy and other national resources.
15. This very brief analysis clearly shows that environmental problems are extremely complex and many-sided. To make them more amenable to international action, the United Nations Environment Programme has divided its activities into two parts: functional tasks consisting of three normative categories, and priority subject areas covering six descriptive divisions. The functional tasks are evaluation of the environment, environmental management and supporting measures such as environmental education. The priority subject areas, which represent another way of categorizing the problems, are human settlements and health, terrestrial ecosystems, environment and development, oceans, energy and natural disasters.
16. As regards Unesco's environmental education projects, the organization's medium-term plan for 1977–1982, adopted by the General Conference at its 19th session, distinguishes ten sets of problems concerning various aspects of the present world situation. Chapter VII of this plan, which deals with "Man and his Environment" defines the way in which Unesco proposes to tackle these problems with the aid of "interdisciplinary undertakings for improving the quality of the human environment in general", which means that the normal scientific and technical approach must provide for "increased and decisive contributions from the social sciences, the humanities, culture, education and communication, as well as for close co-ordination of all these activities". The chapter is divided into seven objectives, the most directly relevant of these dealing with "the improvement of individual and collective behaviour towards the human environment through general education and public information, based more particularly on the study of perception of the quality of the environment". The other objectives refer to:

(1) study of the geosphere, as a basis for the understanding and rational use of mineral and energy resources; (2) study of terrestrial biological resources and interrelationships between human activities and terrestrial ecosystems; (3) study of water resources and their rational management; (4) study of ocean and coastal systems and their interactions with human activities; (5) study of the functioning and socio-cultural characteristics of human settlements with a view to improving the design of urban systems; and (6) preservation and presentation of the cultural and natural heritage (works, monuments, sites, natural areas, biological reserves).

Significance and Implications of Environmental Problems in the Context of Development

17. The relationship between environment and development has been under discussion for nearly ten years now. At first it was thought that concern for the environment necessarily conflicted with development aims. This was because ideas on the subject were still elementary: environmental problems being narrowly equated with pollution abatement and conservation, while development was equally narrowly equated with an increase in the gross national product. Considerable progress has been made since then. The definition of the environment has been enlarged and embraces, for example, a series of factors specific to the developing countries which stem mainly from underdevelopment and poverty. Moreover, development problems are being increasingly viewed in terms of their socio-economic causes and effects. Solutions have therefore to be found that will take this broader conception into account. It has been realized that the problems of development and of the environment should be tackled simultaneously and that the work of developing and protecting the environment must be planned on a comprehensive integrated basis.
18. It follows from this realization that countries do not have to choose between development and the environment, which would largely be a false dilemma; they should rather choose the *quality* or type of development that they wish to adopt. The environment must therefore be regarded as an essential aspect of development, as the objectives and strategies for the environment and for development must complement each other. This merger of concerns and issues has resulted in the establishment of a series of objectives that can be summed up as follows: the satisfaction of basic human needs, improvement of living conditions, the continued promotion of development, respect for the limitations of the assimilative and reactive capacity of the planet's

biosphere, the rational management of resources and consideration for the needs of future generations in the undertaking of activities.

19. It is essential, in order to achieve these objectives, to devise new national and international approaches and formulate an international strategy which will be truly world wide. The management of the environment is a vital element in this overall effort. This entails taking the environment into consideration in public decision-making processes at the various levels of government. This process will make it possible to ensure that development is continuous and in keeping with environmental requirements and that it can thus contribute to the well-being of present and future generations. Efficient management of the environment requires the co-operation of many institutions and the contribution of several disciplines. It demands an integrated approach to decision-making, based on an understanding of the links that exist between man and nature.
20. To achieve an objective as ambitious as the management of the environment, man's outlook and attitudes must be transformed and new knowledge must be acquired. This idea is having considerable repercussions on education at the present time. In preparing the Conference on Environmental Education, the aim of Unesco and UNEP has been to introduce, in the theory and practice of education, the new approaches and new data that are indispensable for fostering changes in attitudes, creating a new awareness and disseminating the necessary knowledge. Just as the environmental dimension makes it possible to broaden traditional concepts of development, so environmental education can help to renew traditional concepts of education by bringing education closer to the complex reality of the major problems in the contemporary world.

The Human Environment in the Context of a New International Economic, Social and Cultural Order

21. As regards the attempt to find new bearings which could give development its full impact and maximum effectiveness in terms of the improvement of living conditions throughout the world, the first years of this decade witnessed the emergence of an important new concern among international institutions and among writers on the subject all over the world. This seemed at the outset to be mainly bound up with problems of pollution and of the use of natural resources, within the context of population growth; but since the United Nations Conference on the Human Environment (Stockholm, 1972), the environment has begun to be seen in a

broader context, one that concerns and in some way involves all countries in the world and is focused on the correlation between living conditions and the development process. Seen from this angle, the human environment, in its biological, physical and socio-cultural aspects, is regarded both as a point of departure and as a goal of the development process.

22. The main concern of all national and international action should be the improvement of the living standards and conditions of all the world's inhabitants. This aim implies a development effort without which men and women cannot be provided with the amenities and possibilities for fulfilment that give dignity to their existence. An endeavour of this kind is the fruit of work, of social organization, of technology and also of the rational use of environmental resources. In this context, as several countries pointed out at the Stockholm Conference, living conditions are governed by the state of underdevelopment in which the majority of countries are placed. For this reason, the possibilities of improving their situation lie in the continuation and stepping up of development itself.
23. It is, however, probable that development, with the advance of science and technology, will have an even greater impact on the environment and that it may have the effect of creating problems similar to those that the developed countries are facing today. All countries will, therefore, have to take remedial action which, within the framework of planned development, should take account at national and international levels of the various aspects of social life in their interaction with the biophysical environment and strive to preserve and strengthen the balances that are essential to a constant improvement of the quality of life.
24. The recent appearance of "alternative models of development" is the outcome of a new awareness which has brought home the need for a more holistic approach to development, taking into consideration the environment and the rational use of natural resources. A series of themes that should lead to the definition of new orientations for development have of late been discussed in the major international forums. These orientations would seem to indicate that new development should be viewed as a *diversified process*, involving all sectors and groups of a given community on a *long-term basis* and encouraging the seeking of solutions to immediate environmental problems while ensuring the continuity of future development. Seen in this way, development can no longer be the straightforward application to the whole world of the ways of thinking, experience, knowledge and lifestyles specific to one region or one culture. On the contrary, the direction and pace of develop-

ment must be defined on an *endogenous* basis by each society in the light of its needs, its socio-economic objectives, the particular features of its environment, and the impact of development on the biosphere.

25. A new approach to development is necessary. It is vital to satisfy basic human needs and establish a more equitable international economic order, but these efforts should also take account of the room left for manoeuvre by the natural resources available to mankind. At a time when economic and political relationships are so closely interwoven and when the effects of the environmental situation are felt all over the globe, the implementation of such a process cannot be effective without a world-wide effort. The way in which the new lines of emphasis should be worked out, planned, put into practice and evaluated is, therefore, linked with the interpenetration of a number of national and international factors. There seems little doubt that problems such as hunger, the creation of giant cities, air and marine pollution, desertification, deforestation, etc., will otherwise be insoluble.
26. For this reason it would be impossible to overstate the importance of the resolution adopted by the 6th Special Session of the General Assembly of the United Nations (April-May 1974), in which the Member States of the United Nations proclaimed their united determination to work urgently for the establishment of a new international economic order based on equity, sovereign equality, interdependence, common interest and co-operation among all States. The Final Act of the Helsinki Conference on Security and Co-operation in Europe (1975) also stressed, with regard to a development effort on a world scale, the importance of working for peace and better international understanding, stating that "the success of any environmental policy presupposes that all population groups and social forces, aware of their responsibilities, help to protect and improve the environment, which necessitates continued and thorough educative action, particularly with regard to youth".
27. The difficulties inherent in such a sweeping change in ideas and institutions mean that a gradual evolution in the situation has to be accepted. Providing for the future means establishing here and now the basis for strengthening awareness of the environment and an environmental ethic on a world scale; it also means setting up a system that will promote the development of *scientific and technical capacities* to tackle the problems implicit in the improvement of the environment. This also means encouraging *effective participation* by the active sectors of the population in the process of devising, adopting and monitoring the policies based on the new approach to development.

28. Scientists, technicians and decision-makers should, in fact, take the will of the people into account when deciding on the development process that will be the least costly in social terms. It is obvious in this connection that there can be no hope of applying viable solutions to the problems of the human environment without *changing general and specialized education* at its various levels. The aim must be, here and now, to enable persons of all ages and from all walks of life to *understand* the basic relationships that link man to his environment and to promote *responsible behaviour* in relation to the environment in order to ensure its constant improvement.

29. The establishment of a general framework for *environmental education* is a necessity unequivocally acknowledged by the international community at the United Nations Conference on the Human Environment (Stockholm, 1972). Under the terms of recommendation 96 of that conference, "the organizations of the United Nations system, especially the United Nations Educational, Scientific and Cultural Organization, and the other international agencies concerned, should, after consultation and agreement, take the necessary steps to establish an international programme in environmental education, interdisciplinary in approach, in school and out of school, encompassing all levels of education and directed towards the general public, in particular the ordinary citizen living in rural and urban areas, youth and adult alike, with a view to educating him as to the simple steps he might take, within his means, to manage and control his environment". In pursuance of this recommendation, Unesco and UNEP have jointly been implementing since 1975 an international environmental education programme, under which the Inter-governmental Conference has been convened.

B. Chapter II The Role of Education in Facing the Challenges of Environmental Problems

30. The beginnings of environmental education go back a long way but it has assumed greater importance recently because of the increased awareness of certain problems such as those just referred to. This chapter attempts to give a comprehensive survey of the ideas that have emerged so far concerning the ultimate aims and characteristics of a type of education the stated purpose of which is to contribute to a better understanding of the human environment and to the solution of its problems. These ideas reflect the changes that have occurred to date in the environment concept.

31. The successive stages in human culture and civilization are largely determined by the forms of man's relationship with nature, and particularly by the action taken by man and the instruments he has created in order to use nature to ensure his own existence and full development. Man has, from his earliest beginnings, provided himself with the means of influencing and transforming the environment, with often beneficial but at times adverse effects for his own life.

32. The beneficial or adverse nature of the effects of this transforming action is determined by factors bound up with the various economic, social and cultural systems, and defining the various ways in which man views and enters into relationship with nature. Among these determining factors, mention may be made of social institutions, the extent and nature of knowledge, and the system of values that affects the behaviour of individuals and of the community in relation to the environment. The role that education can play in creating awareness of environmental problems and in their understanding and solution can, therefore, be clearly appreciated. Experience has repeatedly shown that policies, legislation and action for the preservation and improvement of the environment have failed to achieve the desired effect because educational work has not been made a functional part of these projects. The current recognition of the importance and urgency of environmental education is partly the result of this realization.

Evolution of the Concept of Environmental Education

33. The concept of environmental education has, in its evolution, remained closely linked with the concept of environment itself and to the way in which this is perceived. The view of the environment equating it with its biological and physical aspects has given way to a wider conception which takes into account its economic and socio-cultural aspects and emphasizes the correlations between them.

34. Education has, in a way, always been associated with the environment. In earlier societies, and still today among large sectors of the rural population, man's preparation for adult life involved on intimate experience of nature. The curricula of modern systems of education have, up to a certain point, always included aims and content related to the environment, even if this was seen primarily in its biophysical aspects. This was the case in particular of subjects coming under the "natural sciences", which were in any case taught separately and without co-ordination. In this traditional context, the pupil was himself expected to draw together the threads of the knowledge acquired, to form from this an over-

view of the world around him and to perceive the relationships between its various elements. This education was too often abstract, divorced from the real world which it claimed to study. It was, moreover, too exclusively bent on imparting knowledge concerning nature and often neglected to stress and develop responsible behaviour towards nature. The very conception of the environment, reduced to its natural aspects alone, overlooked the contribution that the social sciences could make to understanding and improvement of the human environment. Subjects like geography, which could have provided the framework for integrated environmental education, were, at best, generally taught as science subjects.

35. More recently, as a result of economic concerns and the development of ecological disciplines, the environment has come to be explicitly included in education, but attention has been focused primarily on the problems of conservation of natural resources and the preservation of animal and plant life, or related subjects.
36. At the present time, and as a result of the concern expressed and the guidelines formulated at the United Nations Conference on the Human Environment (Stockholm, 1972), new approaches to environmental problems are envisaged. Although the biological and physical aspects admittedly constitute the natural basis of the human environment, the socio-cultural and economic dimensions define, for their part, the lines of emphasis and the conceptual and technical instruments that enable man to understand and make better use of the resources of nature in the satisfying of his needs.
37. In this connection, recent years have witnessed the development at the national, regional and international levels of new ideas on the role and objectives of environmental education. The International Workshop held at Belgrade (1975), the meetings of experts that have taken place in 1976 and 1977 in different parts of the world under the International Environmental Education Programme (Unesco/UNEP) and national or subregional meetings organized by Member States have made it possible to formulate concepts that should give new bearings to this education as it is put into practice.
38. It will be seen that this education is not something tacked on to curricula as a separate discipline or specific subject (in the same way as mathematics, physics or biology) but represents a dimension that must form an integral part of curricula. Environmental education is the outcome of a reorientation and dovetailing of the various disciplines and of different educational experiences (natural sciences, social sciences, arts and letters), making it possible to achieve an in-

tegrated perception of the environment and to act towards it in a way that is more rational and corresponds to social needs.

Ultimate Aims of Environmental Education

39. The ultimate aims of education – and particularly those of environmental education – cannot be defined without taking into account each society's actual economic, social and ecological circumstances and the objectives established by that society for its development. It nevertheless seems possible and indeed necessary to reach agreement on certain common aims of education such as will foster the progress of mankind as well as the preservation and improvement of the human environment.
40. One of the primary aims of environmental education is to enable human beings to *understand the complex nature of the environment* as this results from the interaction of its biological, physical, social and cultural aspects. It should accordingly provide the individual and the community with the means of interpreting the interdependence of these various elements in space and time so that they may have a greater sense of awareness of their place in the environment and so as to promote a more considered and cautious use of the possibilities and resources of the universe to satisfy the present and future material and spiritual needs of mankind.
41. This education should also contribute to the development of *a national awareness of the importance of the environment in development*, economic, social and cultural. It should foster, at every level, responsible and effective participation by the population in the framing and monitoring of decisions involving the quality of the natural, social and cultural environment. Education should, to this end, disseminate information concerning development alternatives that have no harmful implications for the environment and, at the same time, encourage the adoption of ways of life that will make a harmonious relationship with the environment possible.
42. Finally, environmental education should provide a clear awareness of the economic, political and ecological interdependence of the modern world, where the decisions and behaviour of the various countries can have international repercussions. In this sense, this education has the extremely important task of *developing a spirit of responsibility and of solidarity between countries and regions*, irrespective of their level of development, as the basis of an international order ensuring the preservation and improvement of the human environment. This is the aim towards which international co-operation for the development of environmental education should work.

Objectives of Environmental Education

43. The achievement of such ultimate aims presupposes that education will disseminate knowledge, values, skills and attitudes such as will foster understanding of environmental problems and their solution.
44. As regards *knowledge*, it is for education to provide, with a greater or lesser degree of depth and specificity according to the public for which it is catering, the means for perceiving and understanding the relationship between the various biological, physical and socio-economic factors whose interaction, in time and space, determines the environment. Such knowledge should lead to behaviour and action conducive to the preservation and improvement of the environment. It should be acquired, as far as possible, through the observation, study and practical experience of specific environments.
45. As far as *values* are concerned, environmental education should develop favourable attitudes towards improvement of the quality of the environment. Changes in behaviour patterns with regard to the environment cannot really be brought about until a majority of the members of a given society have freely and consciously assimilated more constructive attitudes and values concerning the environment, which will constitute the basis for *self-discipline*. Environmental education should, with this aim in view, strive to clarify and correlate the concerns and values – ethical, aesthetic and economic – of individuals and communities insofar as these affect the environment.
46. As regards *practical skills*, the aim is to provide all members of the community using a variety of procedures at varying levels of complexity, with a vast range of scientific and technical skills that will enable rational action to be taken upon the environment. In general, the aim is to inculcate, at every level of formal and non-formal education, the ability to acquire, analyse or synthesize, communicate, evaluate and apply existing knowledge on the environment which will facilitate participation in the devising of solutions that can be applied to the problems of that environment. It is through the direct, practical implementation of activities for the preservation and improvement of the environment that these skills can best be developed.
47. The above objectives constitute the aims of unified educational practice. It would be pointless and ineffective for the development of a new global approach to the environment to devise educational activities seeking the piecemeal, partial achievement of certain of these objectives. All environmental education programmes should contribute simultaneously to the development of

knowledge and the acquisition of the attitudes and skills required for the preservation and improvement of the quality of the environment.

The Recipients of Environmental Education

48. The concept of global, lifelong education available to all has obvious repercussions on the conception and organization of environmental education. By its nature and function, it involves society as a whole and should be intended for *all members* of the community, using procedures in line with the needs, interests and motivations of the various age groups and socio-occupational categories. Since this education should be lifelong and available to all, it should be introduced at every level, in school and out.
49. A primary function of environmental education is the *education of the public*. This, while imparting general knowledge to all, should create in them an awareness of environmental problems in their everyday life and encourage the adoption of coherent behaviour and real involvement in these problems. This education should be provided at every age and at all levels of formal education (pre-primary, primary, secondary, higher education, for pupils and teachers alike) and in the various non-formal education activities for young people and adults, irrespective of the population group to which they belong. It must be integrated with general education in each country and develop through all educational institutions and all education programmes.
50. Its second function is the *education of specific occupational or social groups*, whose activities or influence have an important bearing on the environment. Those directly concerned here are engineers, architects, town-planners, economists, lawyers, property developers, industrialists, trade unionists, doctors, etc. In order to make these people aware of the effects of their decisions and acts on the environment, educational programmes should be designed in relation to the occupation and the social group in question. This type of education can be made an integral part of formal education, e.g., in schools of engineering and architecture, faculties of medicine, law, etc., or in institutions responsible for training the various groups exercising social responsibilities, during either pre-service or in-service training. It can also be organized on an *ad hoc* basis (seminars, training courses, attachments, etc.).
51. A third function has to do with the *training of certain professionals and scientists* working on specific problems of the environment. This is a very wide group of people with a variety of technical skills, some of them being highly spe-

cialized (e.g., in the planning of the use of resources, techniques for the monitoring of air and water pollution, landscape architecture, etc.), while others receive interdisciplinary training equipping them for tackling complex problems. We should also include specialists in the basic natural or social sciences (biology, chemistry, ecology, economics, sociology, etc.). By their specialized research and practical experience, all these professional and scientific workers are called upon to lay a solid foundation of knowledge on which environmental education and training can be based.

52. It would, however, be worthwhile pointing out that the three functions referred to are inter-related as regards both the content of environmental education and the institutions responsible for such training. Environmental education is a continuum and the three functions identified here for methodological and operational purposes should be carried out on a co-ordinated basis. It is essential that the lines of emphasis and content form a coherent whole, based on practical experience and scientific knowledge, which can serve as a common point of reference for the various environmental education activities.
53. To sum up, such education can be seen as a process during which individuals and the community are made aware of their environment and of the interaction of its biological, physical and socio-cultural components, and acquire the knowledge, values, skills, experience and also the will to enable them to act, individually and collectively, to solve the present and future problems of the environment. This education should inspire the conduct not only of the public but also of those in authority whose decisions have repercussions on the environment.

Characteristics of Environmental Education

54. The ultimate aims described in this chapter impose certain characteristics upon the educational process and make it necessary to meet certain requirements, as regards the design and structure of the educational content, teaching and learning methods, and the organization of this process.
55. Perhaps the most important characteristic of education of this kind is its *approach geared to the solution of the specific problems of the human environment*. The aim is to enable individuals, irrespective of the population group to which they belong and whatever their level, to become aware of the problems that form an obstacle to individual and collective well-being, to analyse their causes, and to assess ways and means of solving them. It is also the aim to ensure the participation of the individual in the collective definition of strategies and operations

to solve problems affecting the quality of the environment.

56. The fact that there are so many environmental problems today is partly due to the fact that very few people have been trained for the accurate identification and *effective solution of concrete, complex problems*. Traditional education, which is too abstract and fragmentary, has been unsuccessful in preparing individuals to face the changing complexity of reality. An education geared to the specific problems of the environment implies, on the contrary, that the different aspects of knowledge combine to provide the explanation for complex realities.
57. Another basic characteristic derives from this, namely, the *interdisciplinary approach* to environmental problems. To understand these fully, there must be an awareness of the correlations between phenomena and of the problem situations that a unidisciplinary approach would tend to split up. Disregarding the frontiers separating specialized disciplines, the interdisciplinary approach seeks to give a more comprehensive and less cursory picture of the problems. It does not consist in juxtaposing different disciplines on an *a priori* basis but in grasping the process in its entirety and then proceeding to analyse and solve the specific problems.
58. The interdisciplinary approach to environmental problems implies, in fact, that consideration be given first to the system of which the phenomenon that is causing the problem forms part. To explain a phenomenon it is thus necessary to establish a comprehensive frame of reference incorporating the particular contribution of the various disciplines and showing their interdependence. This approach also makes possible the identification, rank-ordering and dovetailing of certain vital political, economic, social and ecological needs in the process of planning national development. Truly interdisciplinary education is an arduous undertaking which has to be approached gradually. It presupposes *ease of contact between educators*, made possible by the provision of a new type of training for those concerned and by appropriate organization of the teaching system so as to take into account the conceptual and methodological affinities between different disciplines.
59. The need to devise a type of education that will meet social needs effectively brings us to another of the main characteristics of environmental education: the fact that it is *open to the surrounding community*. An education that seeks the solution of concrete environmental problems implies not only the development of knowledge and techniques but also, and more important still, practical action by the community in specific environments. It is undoubtedly in everyday community life and face to face with the problems

that they find there that individuals and social groups will come to feel concerned with the quality of the environment and will act with resolve and perseverance to preserve or improve it.

60. This community approach is important since it is obvious that many so-called national problems are simply the sum of specific problems that are also common to a number of communities. If certain problems specific to one community can be solved, a step forward will have been taken in improving the environment of larger units such as the country or region.
61. Furthermore, the improvement of the quality of the environment demands a political will and an effort by the different sectors of the community, drawing on their various skills and resources. The actual combining of cognitive faculties and other components such as values, aesthetic judgement and creativity and technical skills will come about in the co-ordinated effort and the participation of individuals - within the various groups, services and institutions that make up the community - in the understanding, rational management and improvement of the environment.
62. The final essential aspect of environmental education is its *lifelong and forward-looking character*. Until a recent period in the history of mankind, changes in the socio-cultural and natural environment occurred slowly. Under these circumstances, the younger generation could be instructed in their parents' values and knowledge, and hand these down to their children, in the certainty that this cultural heritage would be sufficient to ensure their integration in society.
63. Since the industrial revolution and, more especially, during the second half of this century, this pattern has been profoundly disrupted. The extraordinary advance of scientific knowledge

coupled with its technological applications have increased man's influence on his environment and accelerated the changes occurring in it. The various aspects of the natural and human environment are now changing extremely rapidly, resulting in the constant emergence of new economic and socio-cultural systems and hence of fresh problems. For the first time in the history of mankind, knowledge, technical skills and certain values are changing in less than the space of one lifetime. Under these circumstances, an education which seeks the solution of environmental problems must be a continuous process. So as to prevent the knowledge acquired by people becoming obsolete and to guarantee the long-term effectiveness of the operations undertaken, environmental education must constantly readjust its sights and revise its content and its methods; it must, at the same time, ensure that the information acquired by the various groups is continually updated and adjusted in the light of new situations. It thus falls within the context of life-long education.

64. The characteristics just analysed may be regarded as guidelines for action in the field of environmental education. They indicate the path to follow, while taking account of the actual circumstances of each country or region. The many aspects of the environment and the wide variety of people involved in this type of education will demand a flexible, diversified application of educational approaches.
65. It is for Member States to make the necessary efforts to define the characteristics and modalities of environmental education by reference to the objectives assigned to it, and to adapt the various components of the educational process. In many cases, the integration of education of this kind into the country's various educational activities will indeed entail certain reappraisal and innovations in content, methods, teacher training and the organization of formal and non-formal education. In this connection, special attention should be paid to the specific role of educational institutions (schools, colleges, universities, etc.) and to their importance as bases for training and for developing the attitudes and skills required by environmental education. In fact, the educational effort to improve the environment should begin with the creation of appropriate environments within these institutions themselves. In this sense, environmental education could be one of the paths towards the transformation and regeneration of education, so widely desired today, as well as a decisive means of promoting an education more in keeping with the real experience, needs, problems and aspirations of individuals and societies in the modern world.

66. There is no doubt that education can and must play an essential role in preventing and solving environmental problems; but it is obvious that the educational effort cannot take full effect if other important factors are disregarded, such as, for example, legislation which pursues the same aims, measures to monitor on the proper application of the laws, firm decisions, actions by the mass media, which have a constantly growing influence among the population, etc. All these factors should work in the same direction and form a coherent whole, thus contributing effectively to improvement of the environment. Education should, with this aim in view, make politicians, civil servants and others in authority whose decisions constitute society's response to environmental problems, aware of the interdependence of the environment and development, and bring home to them the urgent need to adopt more rational practices in environmental management. If development, unlike growth, is an ongoing process which should bring benefits to all sectors of the population, the environment must be taken into account in development policies. Conversely, environmental concerns which failed to take development requirements into account would lead to the formulation of policies which would not benefit the community as a whole. It is for environmental education to highlight this necessary interdependence of the environment and development.

67. In view of the environmental problems facing contemporary society and considering the role that environmental education can play in their solution, the conference may perhaps wish to formulate principles and recommendations concerning the ultimate aims, specific objectives and characteristics that this education should have in order to fulfill its functions most effectively. The conference could thus help to elucidate the concepts which would facilitate a clearer and more effective formulation of development strategies for environmental education at the national, regional and international levels.

Appendix VII Suggestions for Further Reading

A. Unesco Documents Relating to the Meetings and Colloquia Mentioned

(Available in limited quantity from the Canadian Commission for Unesco)

The Belgrade Workshop

1. *Recommendations of the Belgrade Workshop on Environmental Education* (ED. 76/WS.15).

St. Louis Seminar

2. *Environmental Education: A Canadian perspective*, March 1977. Prepared by Canadian Members of the Seminar Advisory Committee for the North American Sub-Regional Seminar on Environmental Education, St. Louis, Missouri, 5-8 October 1976.

Tbilisi Intergovernmental Conference

3. *Education and the Challenge of Environmental Problems* (Unesco/ENVED 4). This was the main working document of the Conference.
4. *International Programme in Environmental Education* (Unesco/ENVED 5).
5. *Needs and Priorities in Environmental Education: An International Survey* (Unesco/ENVED 6).
6. *Regional Meetings of Experts on Environmental Education - A Synthetic Report* (Unesco/ENVED 7).
7. *Major Environmental Problems in Contemporary Society* (UNEP/ENVED 8).
8. *The United Nations Environmental Programme and Its Contributions to the Development of Environmental Education and Training* (UNEP/ENVED 9).
9. *Final Report of Intergovernmental Conference on Environmental Education*, Tbilisi, October 1977.

B. Other Unesco Publications

10. *Nature and Resources*, Paris: Unesco. This is the Bulletin of the following Unesco programmes: Man and the Biosphere Programme, International Hydrological Programme and the International Geological Correlation Programme. It is a newsletter of research and training activities in the sector of natural resources and the environment, including ecology, and nature conservation, geology, geophysics, geochemistry, geomorphology, hydrology etc. It emphasizes an interdisciplinary approach to the study of environmental issues. Available in English and French.
11. *Trends in Environmental Education*, Paris: Unesco 1977. This book is based on "trend papers" which served as working documents for the Belgrade International Workshop. They describe the state-of-the-art in environmental education in all parts of the world, covering many of its aspects and all of its age levels. Authors are from 13 countries - Argentina, Canada, Czechoslovakia, Egypt, Italy, Japan, Netherlands, Sierra Leone, Sri Lanka, Sweden, United Kingdom, U.S.A. and Venezuela. Available in English and French.
12. *World Trends in Environmental Education*, Paris/Geneva: Unesco - International Bureau of Education, 1976 (Educational Documentation and Information, Bulletin of the IBE, Year 50, no. 200, 3rd quarter 1976.) This is a selected bibliography of literature relevant to environmental education. Available in English and French.

Publications no. 10, 11 and 12 are available from the national distributor of Unesco publications in Canada, Renouf Publishing Company, which will also give you information on prices:

Renouf Publishing Company Limited
2182 St. Catherine Street West
Montreal, Quebec
H3H 1M7
Telephone: (514) 937-3519
Renouf Publishing Company Ltd.
61 Sparks Street
Ottawa, Ontario
K1P 5A6
Telephone: (613) 237-8985
E. & T. Books
221 Yonge Street
Toronto, Ontario
M5B 1N8
Telephone: (416) 363-3171

13. Connect: The EE Network's Newsletter.

Creating a comprehensive network is a principal goal of the International EE Programme. The newsletter *Connect* has been conceived as that network's switchboard, providing the medium for an international exchange of information and ideas between people concerned about environmental education.

The newsletter's quarterly appearance may become more frequent, depending on the need and response. Each issue will have a dominant theme. In addition there will be regular sections, above all the reader-to-reader exchange. *Connect* must reflect the field, not the office. For this, its complete dependence is on its correspondents in the field - you.

Connect's regular sections contain news of Unesco headquarters, its plans and activities; UN agencies, especially UNEP; other government and non-government organizations involved in environmental education. There are news too of regional and national plans, projects and meetings. The editor of *Connect* welcomes, as well, capsule summaries and pertinent comment on curricula guides, books, articles, films and other printed or audio-visual materials for the section "Current and Choice."

Agencies and ministries may subscribe free of charge to *Connect* by writing to:

Joseph Barry
Editor, *Connect*
Environmental Education Programme
Division of Science, Technical and
Vocational Education
Education Sector Unesco
7, place de Fontenoy
75700 Paris
France

C. Publications of Other Organizations Relating to Environmental Education

ERIC/SMEAC

14. *A Report on the North American Sub-Regional Seminar on Environmental Education, 1976.* Available in English only, at the cost of U.S. \$2.50, from:

Dr. John F. Disinger
Associate Director, Environmental
Education
ERIC/SMEAC
Ohio State University
1200 Chambers Road, 3rd floor
Columbus, Ohio 43212
U.S.A.

CERI - Centre for Educational Research and Innovation

A subordinate body of OECD which is fairly well defined by its name - Centre for Educational Research and Innovation (CERI) - also issues reports of special interest to environmental educators and planners. Particularly apt are the following:

15. *Environmental Problems and Higher Education*, 183 pp. Just published. Based on edited working papers discussed at the Rungsted Conference, Denmark, June 1974. EE curricula ideas for such learner groups as in-service teachers, specialists and professionals (doctors, nurses, etc.) receive distinctive attention. Case studies are included in each paper.
16. *Environmental Education at University Level: Trends and Data*, 322 pp. Examines the state-of-the-art in EE among most member countries of OECD. EE objectives are defined, principles of curriculum planning discussed, and the EE Workshop of Tours, France, 1971 reported upon. Besides a country-by-country survey, special sections describe experimental EE at University of Wisconsin-Green Bay, U.S.A., University of Waterloo, Canada, the universities of Paris VII and Tours, France, and the universities of East Anglia and Ulster, United Kingdom.
17. *Environmental Education at Post Secondary Level*, 2 vols. 208 pp. and 184 pp. respectively. Volume 1 is subtitled: The Training of Generalist and Specialists; Volume 2: Courses for Educators, Decision-Makers and Members of Professions Concerned with the Environment. Volume 1 brings together 12 case studies undertaken in various institutions of higher education in Australia, Canada, France, Sweden, United Kingdom and U.S.A. The studies review recent experiments in the training of future environmental specialists and generalists. Volume 2 considers case studies in France, Italy, United Kingdom and U.S.A. dealing with: educators at all levels; environmental decision-makers and professionals, such as engineers, architects, etc., whose work links them to environmental concerns. Each case study involves course content, teachers, research base and instructional materials.

For details, write to:
OECD Publications
2, rue André-Pascal
75016 Paris
France

OECD - Organization for Economic Co-operation and Development The Paris-based Organization for Economic Co-operation and Development (OECD) has a particularly active Environment Committee with four sector groups on air, water and urban management, and on the "unintended occurrence of chemicals in the environment". These groups frequently publish reports, generally in French and English, of special interest to environmental educators, planners and decision-makers.

OECD's geographical focus coincides with the areas covered by the organization's 24 member states in North America, Western and Northern Europe, Turkey, Australia, New Zealand and Japan. Its studies concentrate on the environmental problems of its highly industrialized members and the actions, sometimes coordinated, taken to cope with them. Among its more recent publications are:

18. *Streets for People*, 128 pp. Comprehensive urban and transport planning, states this illustrated report, makes it possible to clear the "inner city" of traffic and free it for pedestrian use without disrupting normal activities. Case histories are presented of cities in Europe which have successfully followed this strategy.
19. *Roads and the Urban Environment*, 191 pp. Further develops the strategy in terms of protective measures taken by road traffic engineers and urban planners regarding traffic noise and vibration, and air pollution.

Economic costs, a primary consideration for OECD, are featured in:

20. *The Polluter Pays Principle*, 120 pp. "The polluter pays principle, means that the polluter should be charged with cost of whatever pollution prevention and control measures are determined by the public authorities, whether preventive measures, restoration, or a combination of both". Further definitions, recommendations and analyses of case studies follow.
21. *Environmental Damage Costs*, 334 pp. It reviews existing studies on environmental damage costs - both monetary and non-monetary (biological, physical and/or psychological), so as to provide decision-makers with these factors for consideration as they establish environmental policy objectives. Complex but useful tables and computations complete the paper-bound volume.

*UNEP - United Nations Environment
Programme*

22. *Annual Report.*

Every year the UN Environment Programme (UNEP) prepares a report on "The State of the Environment" - worldwide - which highlights the main environmental issues of the year requiring the attention of policy-makers and general public. The 16-page, 1976 report is now available (address below) in the five official UN languages. "The report does not suggest solutions: it is designed to stimulate discussion from which solutions may emerge", thus it is eminently useful for environmental educators as a starting point for a global overview.

"The greatest challenge of today", the UNEP report states early, "is to design development so that it satisfies basic needs - beginning with the eradication of poverty - but is environmentally realistic and does not transgress the 'outer limits' imposed by the capacities of the biosphere".

Similarly the report discusses social constraints: "Environmental inequalities in the world are paralleled by economic ones, which are a major obstacle to the satisfaction of basic human needs, especially in developing countries, and a barrier to the harmonious development of humanity." The nuclear arms race, it points out, creates a "potential environmental hazard larger than any other".

After paragraphs on hunger and population, there are equally dense passages on pollution and world climate, pollution and people. Then the report moves rapidly towards "the better management of the environment" with an analysis of the problem and case-history descriptions of actions and successes at the international and national levels.

Environmental education and training have a special mention, of particular interest to the developing world: "The experience of the 'green revolution' for example in India, showed that new strains of crop, new schemes of irrigation and other aids to good husbandry succeed only if they are put in the hands of people who are properly trained and organized to use them." Thanks to an ingenious Satellite Instructional Television Experiment (SITE), "a village provided with a television set and accessories (costing about \$700), even if it has previously been untouched by modern technology, can tune into programmes in its own language, giving local news, entertainment, and instruction on family planning, nutrition, agriculture and education - indeed the very elements of environmental education.

For a copy of the UNEP report in English, French, Spanish, Russian or Chinese, write to:

Division of Communication
UNEP
P.O. 30552
Nairobi
Kenya